Mapping the Future - National Flood Insurance Program (NFIP)

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Overview of Presentation

- Floodplain 101
- NFIP Background
- NFIP Overview
- What is GIS?
- GRANIT
- Map Mod in NH
- Differences between FIRM and DFIRM
- Demos
- You make DFIRMs better
- Questions

Did you know…

- Every year, flooding causes more than $2 billion of property damage in the U.S.

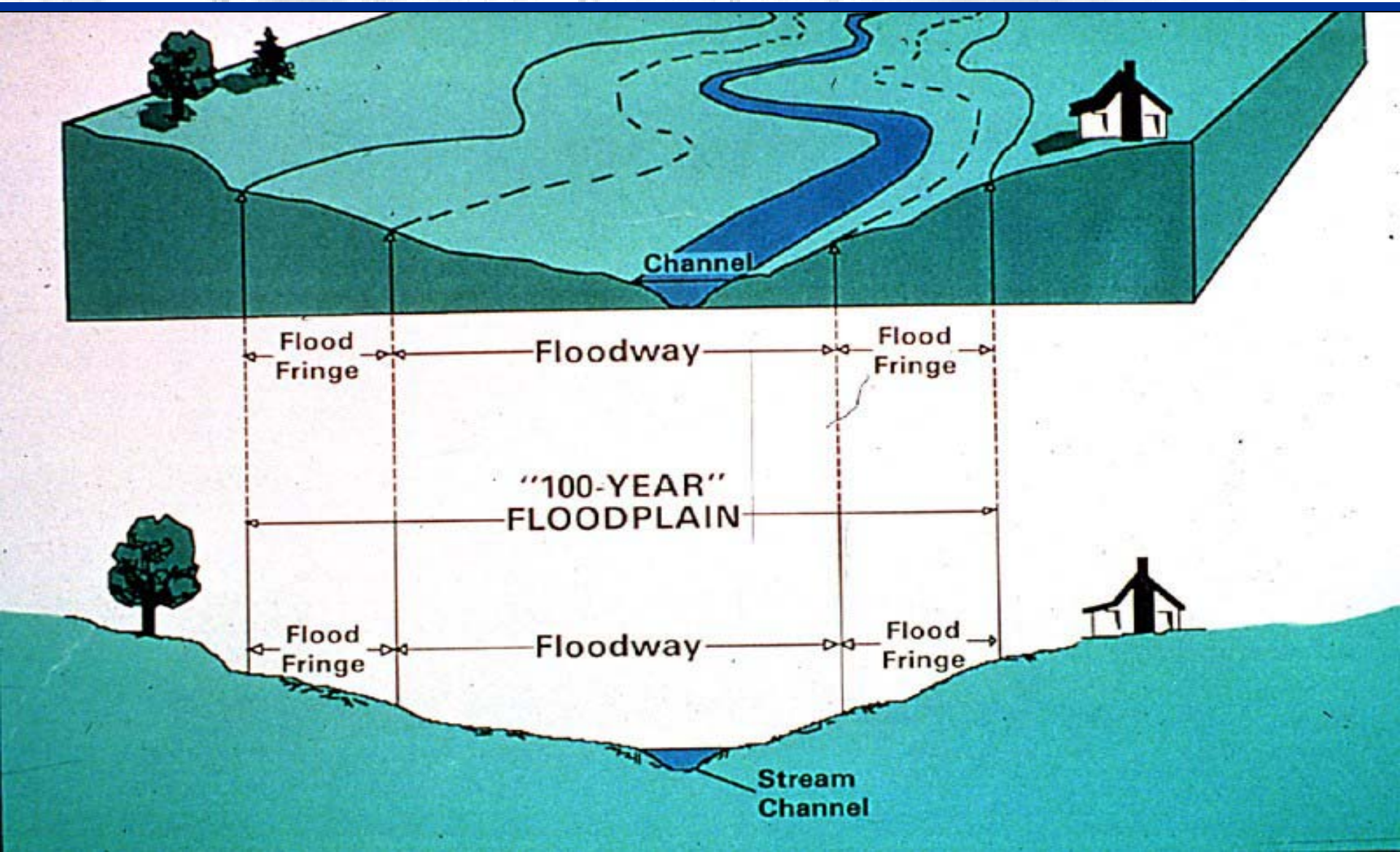
- In a high risk area, your home has a 26% chance of being damaged by a flood during the course of a 30-year mortgage, compared to a 9% chance of fire.

Source: FloodSmart.gov

Keene – October 2005

Alstead – October 2005

Floodplain 101



Floodplain 101

Base or 1% Flood:

A flood having a 1% chance of being equaled or exceeded in any given year; also known as the 100-year flood.

Floodplain 101

Base Flood Elevation (BFE):

The height above sea level to which flood water would be expected to rise in a base, or 100-year flood event.

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What is NFIP?

- Voluntary and mutual agreement between the Federal Emergency Management Agency (FEMA) and a community

- Participating Communities agree to adopt and administer appropriate regulations – in return all of their residents are eligible for federally-subsidized flood insurance

Where did NFIP come from?

- First proposed in the 1950's
- Problems discovered:
  - Funded by taxpayers; helped a few
  - Flood protection structures
  - Continued development in floodplains
  - Disaster relief – inadequate & expensive
  - Unaffordable flood insurance
- Established as part of the National Flood Insurance Act of 1968

What is the Purpose of NFIP?

- Transfer the costs of private property flood losses from the taxpayers to floodplain property owners through flood insurance premiums.

- Provide floodplain residents and property owners with financial aid after floods, especially smaller floods that do not warrant federal disaster aid.

What is the Purpose of NFIP?

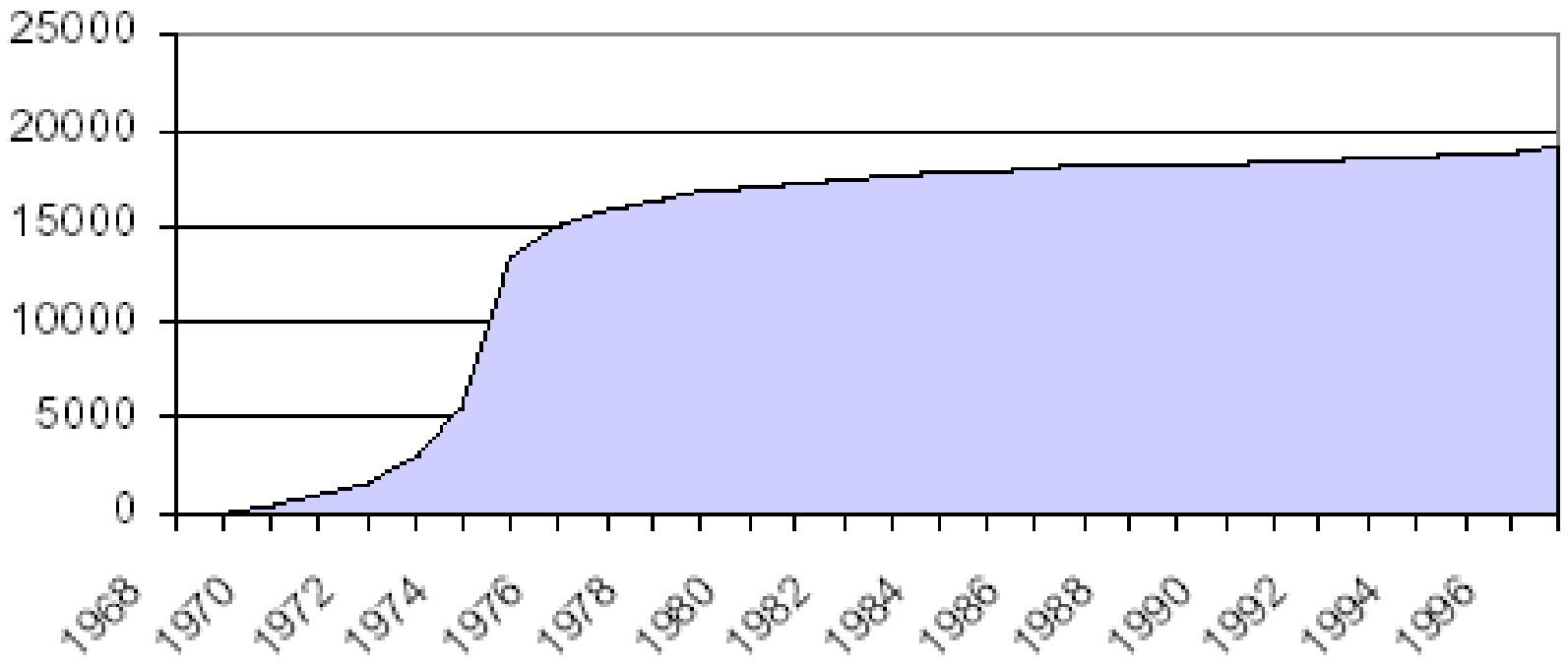
- Guide development away from flood hazard areas.
- Require that new and substantially improved buildings be constructed in ways that would minimize or prevent damage in a flood.

Flood Disaster Protection Act of 1973

- Lending institutions cannot make, increase, extend, or renew a loan for a building located in the floodplain without NFIP flood insurance

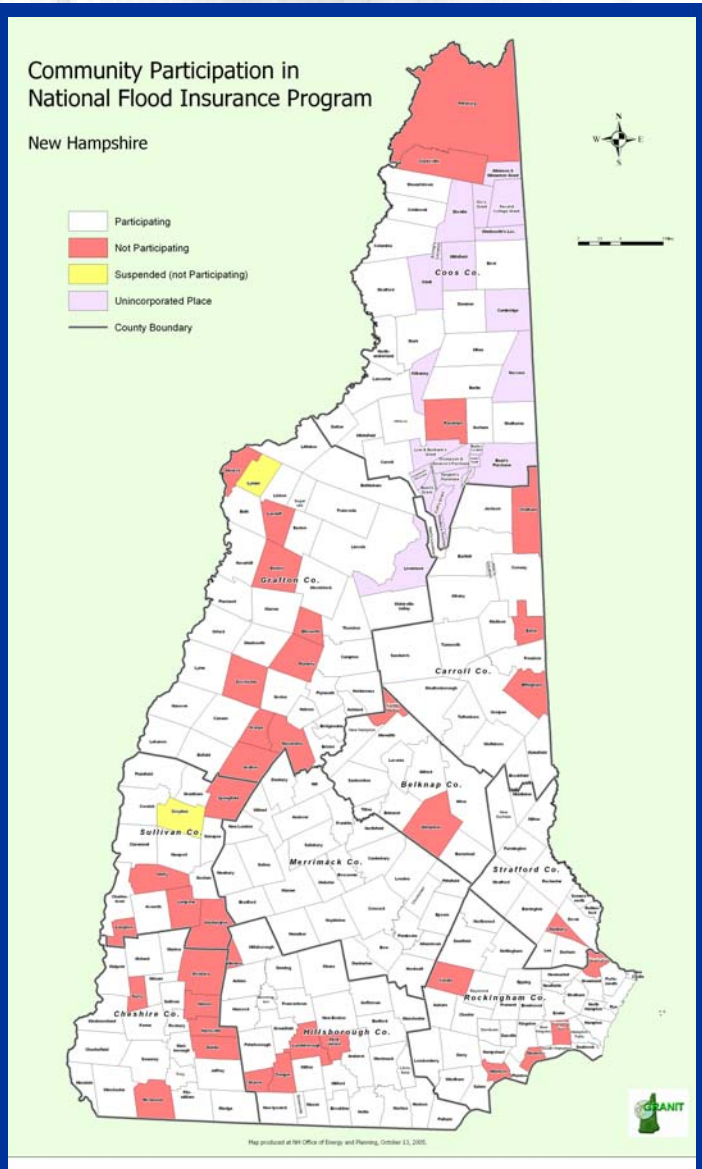
- It is the responsibility of the lender to:
  - determine if the property is in the Special Flood Hazard Area,
  - document the determination, and
  - ensure the insurance is maintained through the life of the loan

NFIP Community Participation



NFIP in New Hampshire

- 194 communities (83%) participate
- 39 communities (17%) do not participate
- 2 communities are suspended



National Flood Insurance Reform Act of 1994

- Authorized the Community Rating System
- Increased the maximum amount of flood insurance coverage,
- Established a grant program for mitigation plans and projects.
- Enacted stricter penalties on lenders to comply

How is NFIP Funded?

- Self supporting since 1986
- Funded primarily through premium income, which pays all administrative and mapping costs as well as claims.

How does a Community Join NFIP?

- Complete FEMA application
- Must adopt a resolution of intent to participate and cooperate with FEMA.
- Must also adopt a floodplain development ordinance and subdivision regulation language that meets or exceeds the minimum NFIP criteria.

Community Responsibilities

- Adopt and enforce a floodplain management ordinance
- Require floodplain development permits
- Review permits to assure that sites are reasonably safe from flooding
- Carefully consider requests for variances
- Maintain records of floodplain development

What Happens if a Community Doesn't Participate?

- NFIP flood insurance will not be available.
- No Federal grants or loans for development may be made in identified flood hazard areas under programs administered by Federal agencies such as HUD, EPA, and SBA.
- No Federal disaster assistance may be provided to repair insurable buildings located in identified flood hazard areas for damage caused by a flood.

What Happens if a Community Doesn't Participate?

- No Federal mortgage insurance or loan guarantees may be provided in identified flood hazard areas. This includes policies written by FHA, VA, and others.

- Federally insured or regulated lending institutions, such as banks and credit unions, must notify applicants seeking loans for insurable buildings in flood hazard areas that:
  - There is a flood hazard and
  - The property is not eligible for Federal disaster relief.

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NFIP Basic Parts

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Insurance

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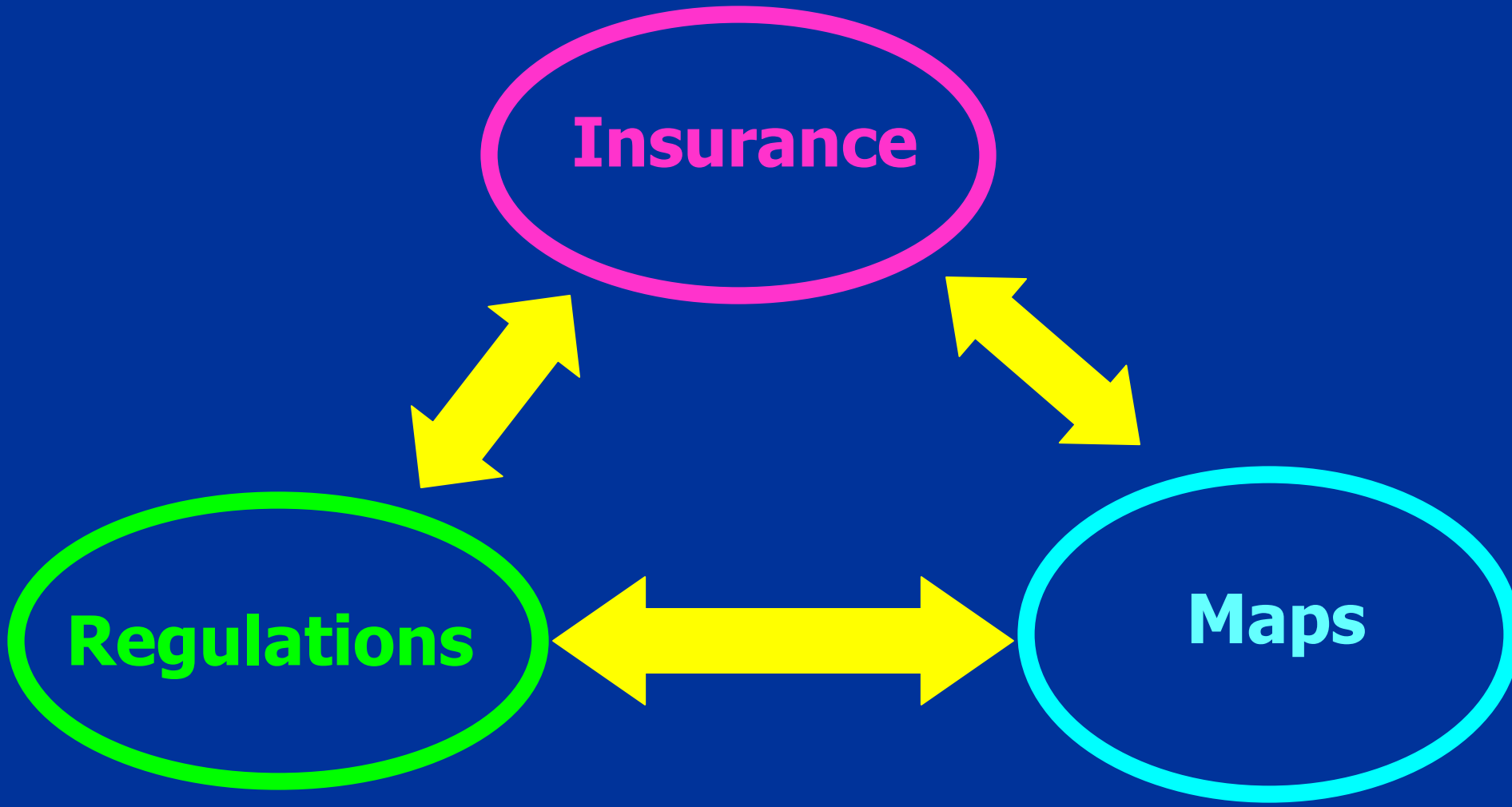
Insurance

Regulations

NFIP Basic Parts

NFIP Basic Parts



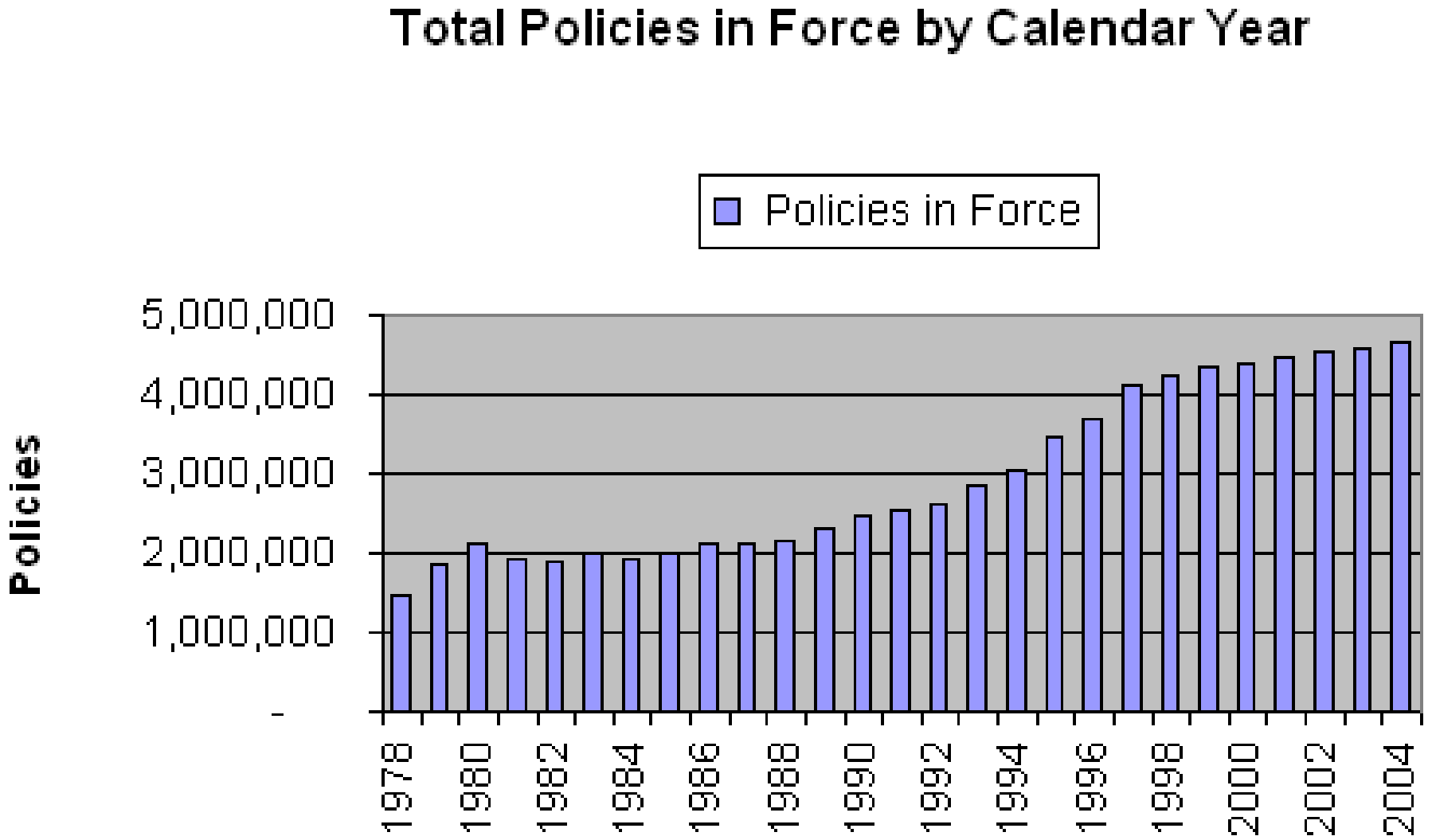
Insurance

Flood Insurance

- **Anyone** living in a participating community can purchase flood insurance, whether their building is located in the floodplain or not.

- For those living in communities that do not participate, insurance is available from private insurers (e.g. Lloyd's of London), and can be hard to find and costly.

Flood Insurance Stats - Nationwide



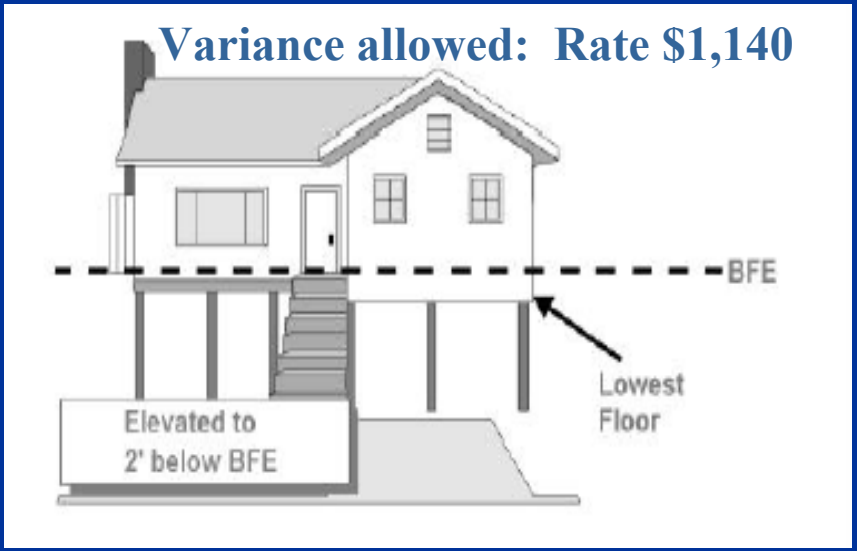
Source: www.fema.gov

Flood Insurance Stats – New Hampshire

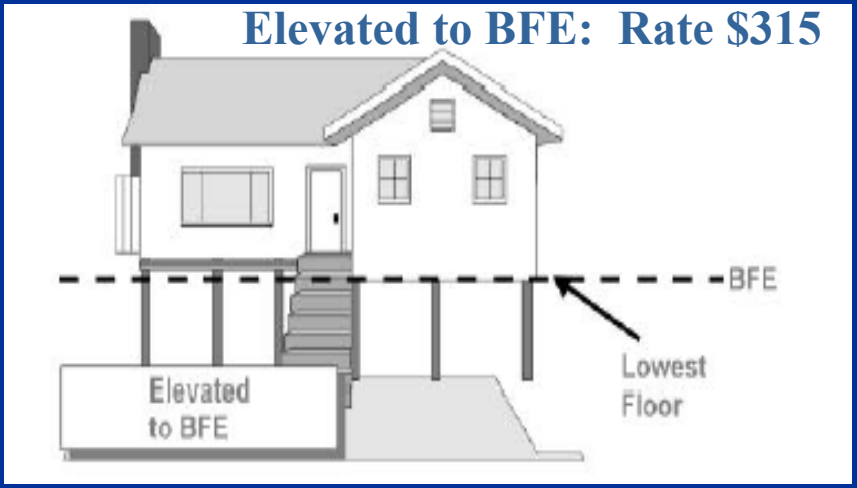
- Currently over 6,500 Policies (almost 50% in Rockingham County)
  - $984 million in coverage
  - $4 million in premiums
- 964 Preferred Risk Policies

Flood Insurance as it Relates to Regulations

- Building not built to regulations = very high premiums or insufficient coverage



- Building built to minimum regulations or more = pay less



Regulations

Floodplain Development Ordinance

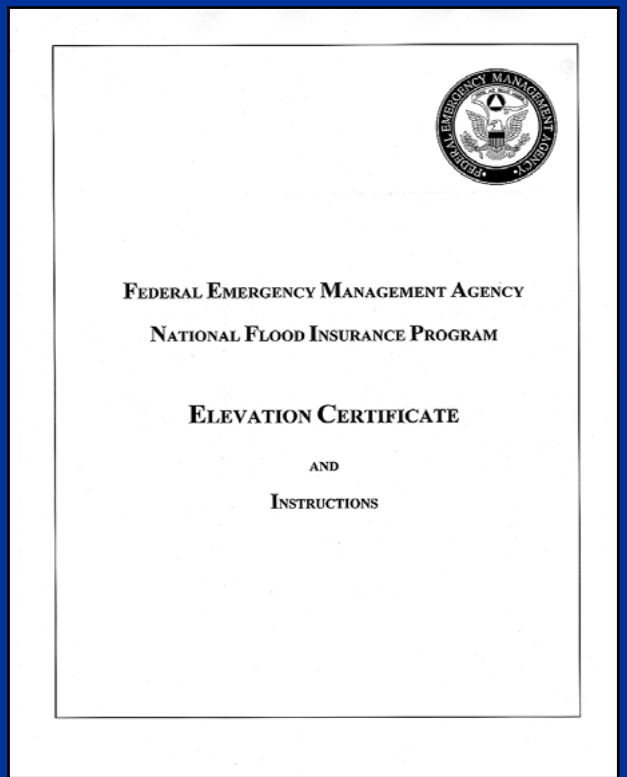
- Regulations are contained in 44 CFR 60.3
- NH OEP has developed a model floodplain development ordinance for communities to use and adopt to meet NFIP minimum requirements
- Communities are strongly encouraged to include language that goes beyond minimum requirements

Floodplain Development Ordinance

- All proposed development in the designated floodplain shall require a permit
- Review permits to assure that sites are reasonably safe from flooding

Floodplain Development Application

Date: _____ **Location:** Tax Map: _____ Lot#: _____
Address: _____
Owner: _____Address: _____Ph. No.:____
Applicant: _____Address: _____Ph. No.:_____
Contractor: _____Address: _____ Ph. No.:_____
General explanation of proposed development:_____
_____



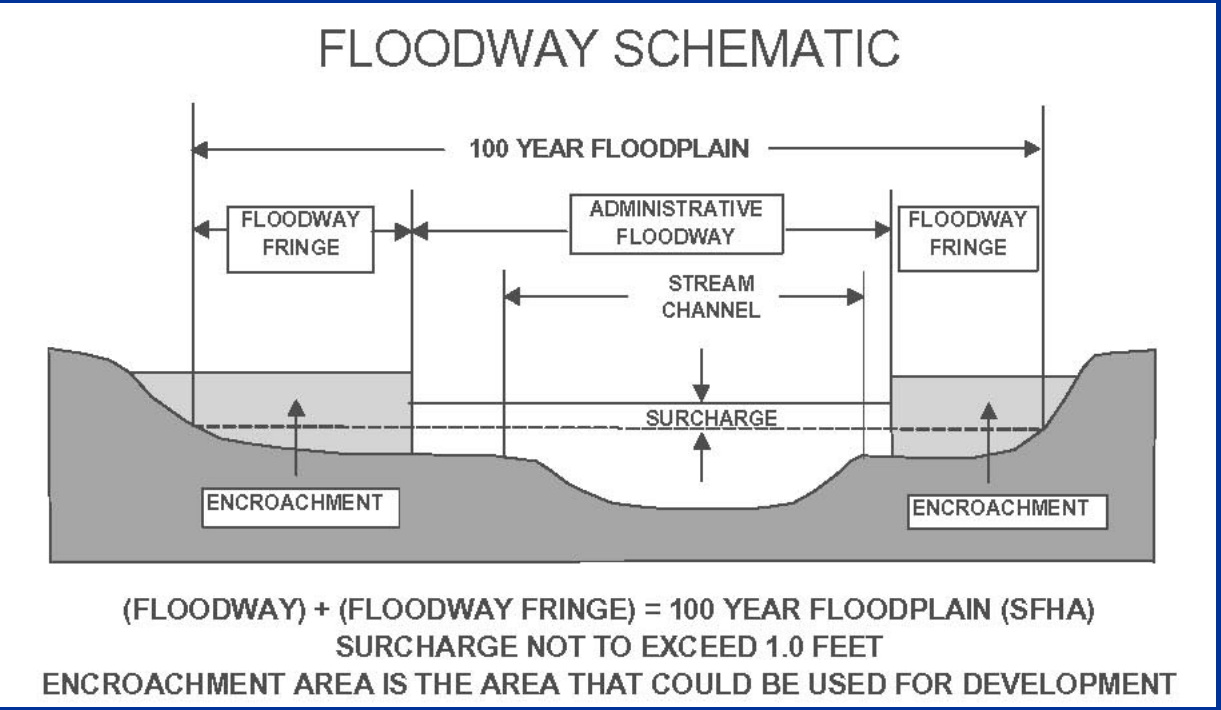
Floodplain Development Ordinance

Requires that new and substantially-improved or damaged buildings be elevated or constructed to resist flood damages

Elevated Foundation

Floodplain Development Ordinance

Prohibits new development or substantial improvements that would increase flood heights in designated floodways

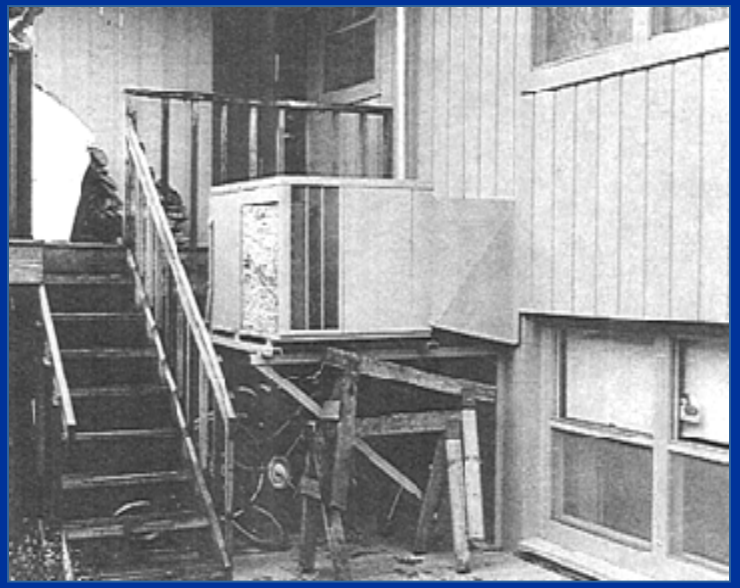


Floodplain Development Ordinance

New or substantially-improved manufactured homes should be elevated on a permanent foundation and be securely anchored

Floodplain Development Ordinance

Utilities should be designed and/or located so as to prevent water from entering or accumulating



Floodplain Development Ordinance

Coastal high hazard areas

- all new construction or substantial improvements should be elevated on pilings and columns

Floodplain Development Ordinance

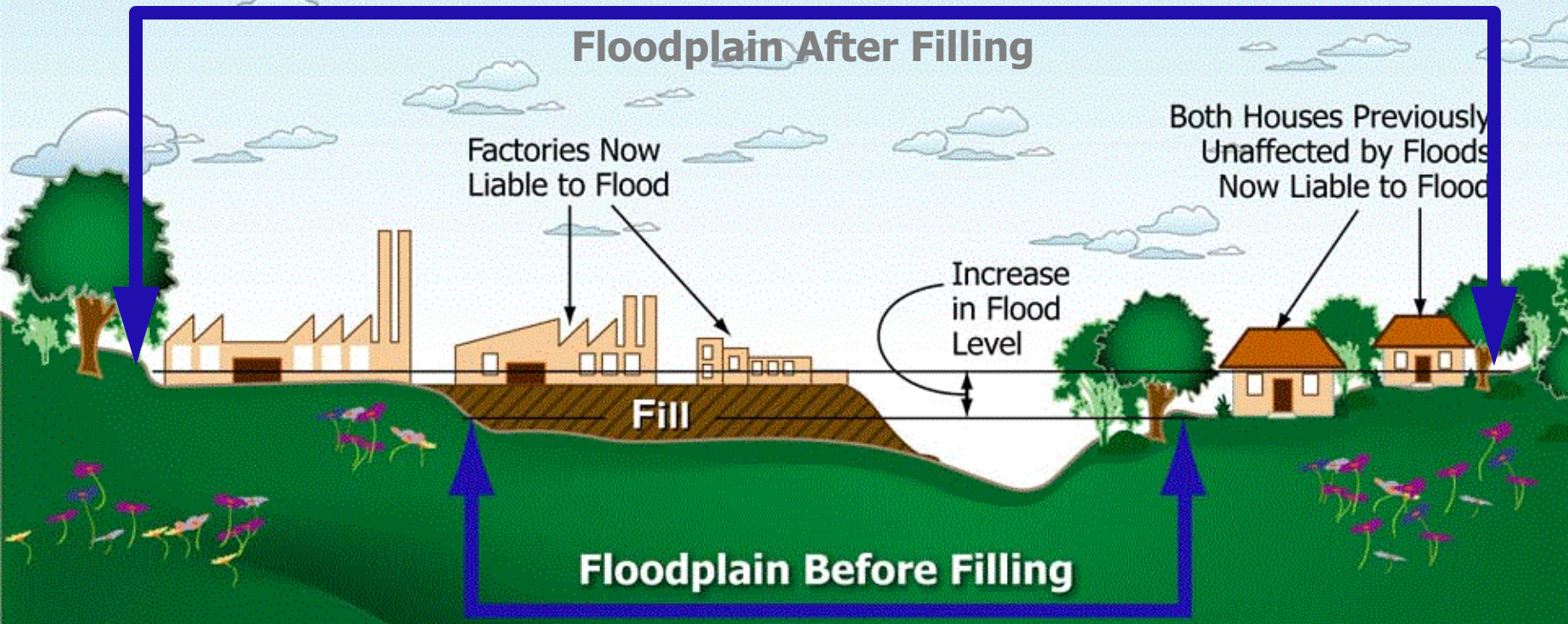
Coastal high hazard areas

- Space below lowest floor must be either free of obstructions or constructed to collapse under wind and water loads without causing damage to the structure

Maintaining Compliance with NFIP

- A community's floodplain management program and permit records are reviewed periodically by FEMA Region 1, OEP, or RPC
- Community assistance visit (CAV) – Completed about every 5 years

Today's Floodplain Is Not Necessarily Tomorrow's Floodplain



If large areas of the floodplain are filled, then there will be an increase in the land area needed to store flood waters.
This means your home or business may be impacted.

Community Rating System

- Voluntary program
- Participating communities can get credits for implementing certain activities above and beyond the minimum requirements of NFIP.
- Residents can get a certain percent reduction in their flood insurance premium rates based on the credits their community earns

Community Rating System

Activity Categories

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Flood Preparedness

Community Rating System

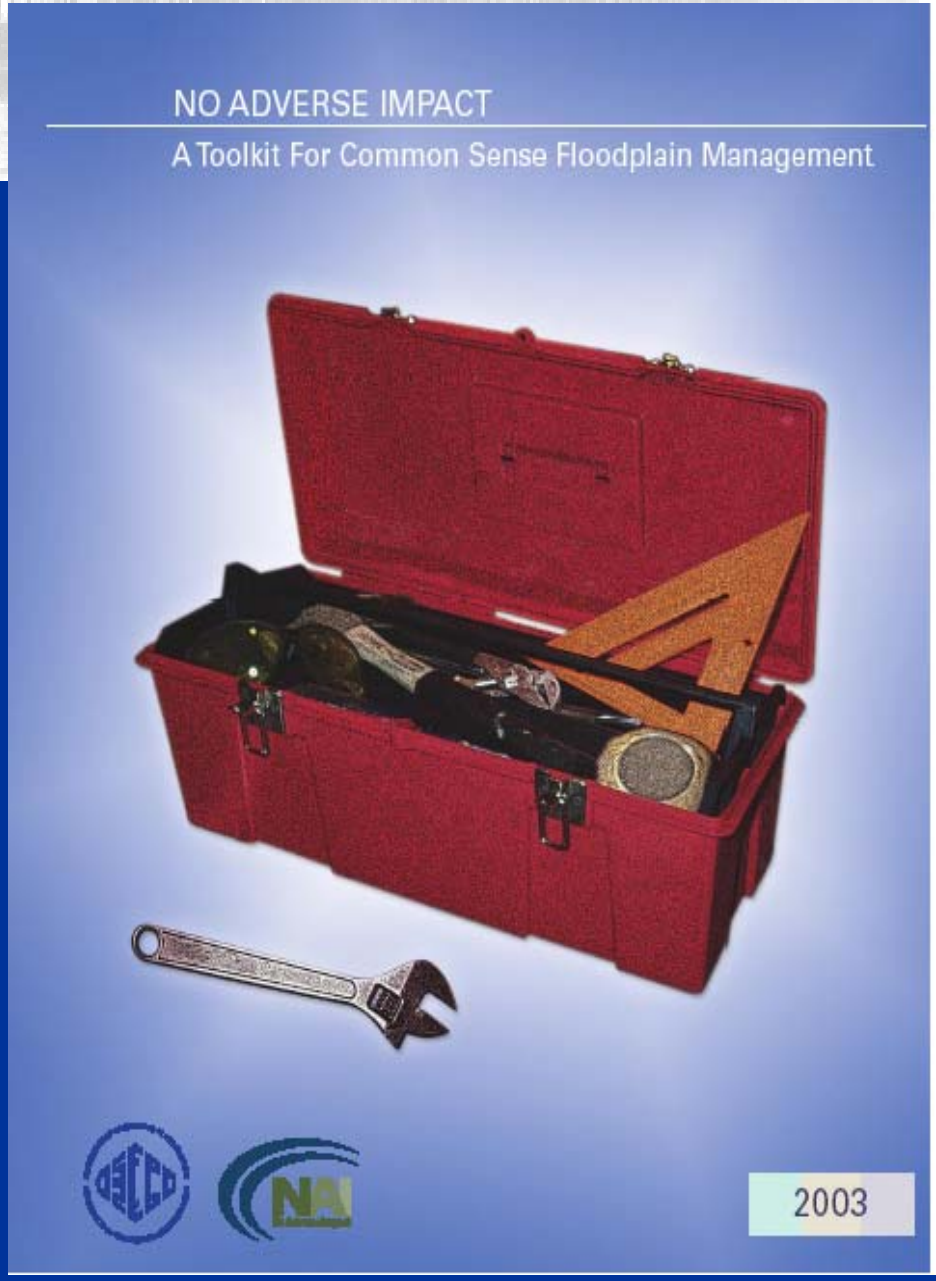
- As of Oct. 2005 – 1,028 communities nationwide
  - Tulsa, OK – Class 2 (40% discount)

- 5 communities in NH
  - **Keene** – Class 8 (10 % discount)
  - **Marlborough** – Class 9 (5 % discount)
  - **Peterborough** – Class 8 (10 % discount)
  - **Rye**– Class 9 (5 % discount)
  - **Winchester**– Class 9 (5 % discount)

No Adverse Impact

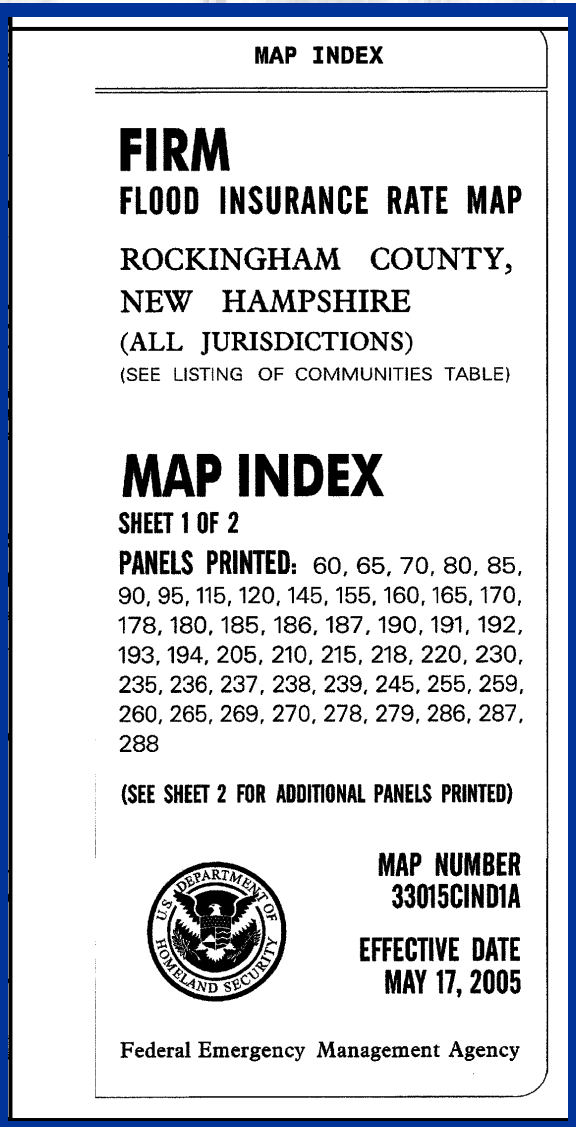
- Developed by the Association of State Floodplain Managers **(www.floods.org)**
- Goes beyond federal and state program requirements
- Tools for communities to provide a higher level of protection for their citizens and to prevent increased flooding now and in the future

- Hazard Identification & Floodplain Mapping
- Education and Outreach
- Planning
- Regulations & Development Standards
- Mitigation
- Infrastructure
- Emergency Services



Maps

Flood Insurance Rate Maps (FIRM)



MAP INDEX

FIRM

FLOOD INSURANCE RATE MAP

ROCKINGHAM COUNTY, NEW HAMPSHIRE
(ALL JURISDICTIONS)
(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX

SHEET 1 OF 2

PANELS PRINTED: 60, 65, 70, 80, 85, 90, 95, 115, 120, 145, 155, 160, 165, 170, 178, 180, 185, 186, 187, 190, 191, 192, 193, 194, 205, 210, 215, 218, 220, 230, 235, 236, 237, 238, 239, 245, 255, 259, 260, 265, 269, 270, 278, 279, 286, 287, 288

(SEE SHEET 2 FOR ADDITIONAL PANELS PRINTED)

MAP NUMBER
33015CIND1A

EFFECTIVE DATE
MAY 17, 2005

Federal Emergency Management Agency

- Show areas that are predicted to flood after intense or major storms
- Estimate how high water may rise (base flood elevation)

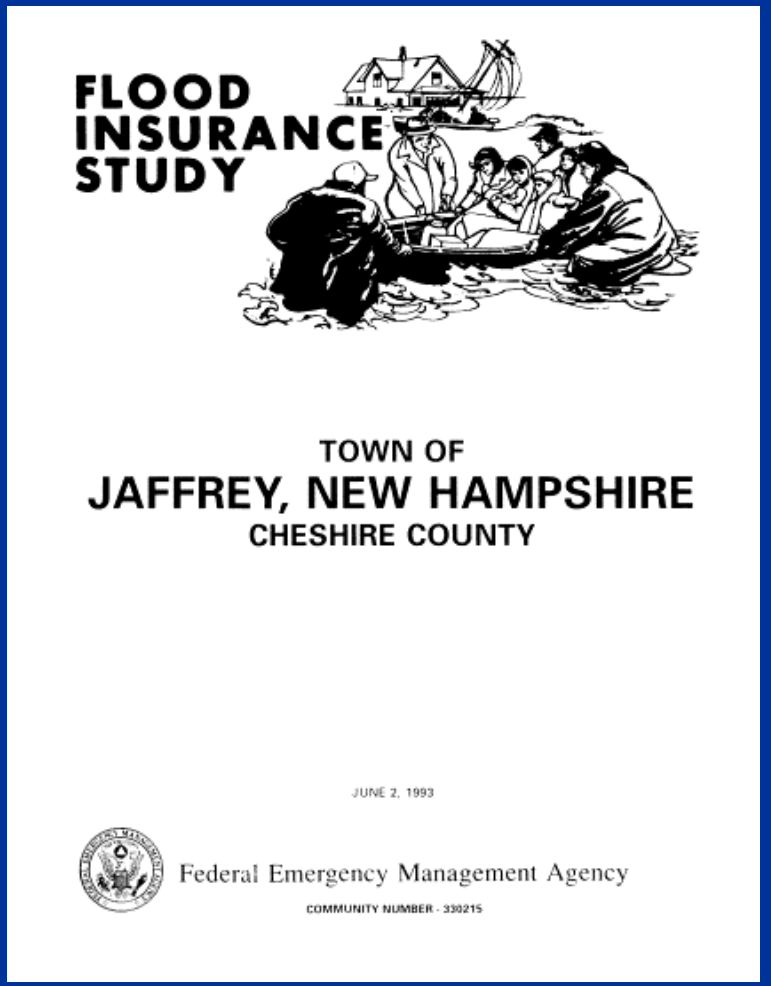
Special Flood Hazard Areas (SFHA)

Areas subject to flooding during the base flood.

- **Zone A** – No BFEs determined.
- **Zone A# or AE** – BFEs determined.

Flood Insurance Study (FIS)

- Summary of Hydrologic & Hydraulic Studies
- Floodway Data
- Flood Profiles
- Summary of Peak Discharges

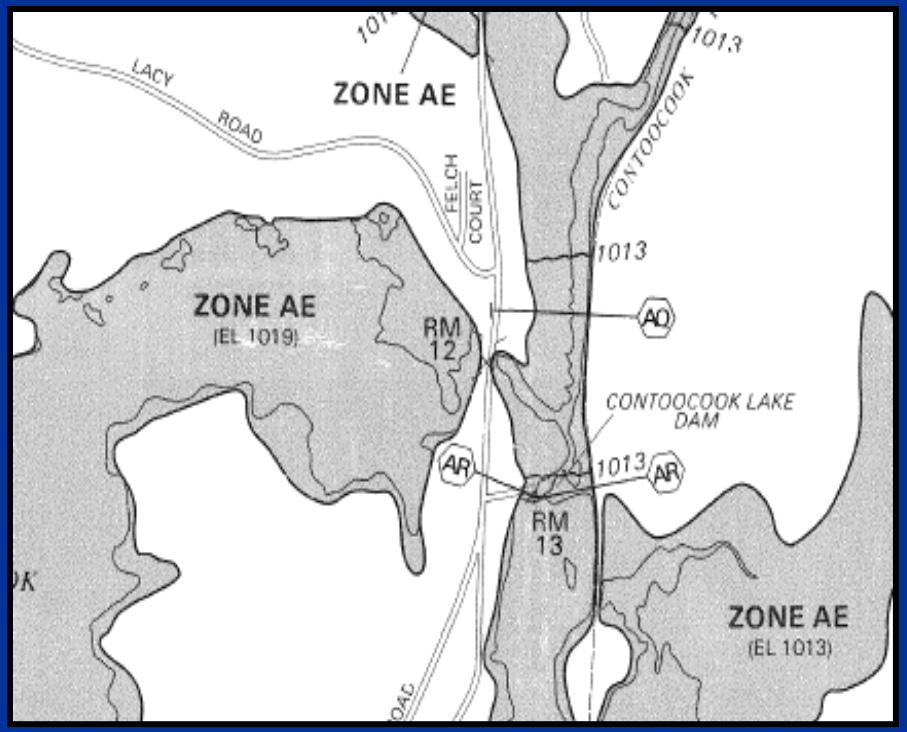


Where Can I get a Map or Study?

- **FEMA Map Store** (for viewing, printing a FIRMette, and purchase) www.store.msc.fema.gov
- **Town Halls** (for viewing)
- **UNH GRANIT** (for on-line viewing)
- **NH Office of Energy & Planning** (for viewing and some free copies)

Who Uses the Maps and Why?

- Communities
- States
- Federal Agencies
- Insurance agents
- Lenders



Letter of Map Change

- Letter of Map Amendment (LOMA)
  - Existing structure or parcel not elevated by fill
- Letter of Map Revision – Based on Fill (LOMR-F)
  - Existing structure or parcel elevated by fill
- Letter of Map Revision (LOMR)
  - Officially revising map to show changes to floodplains, floodways, or flood elevations

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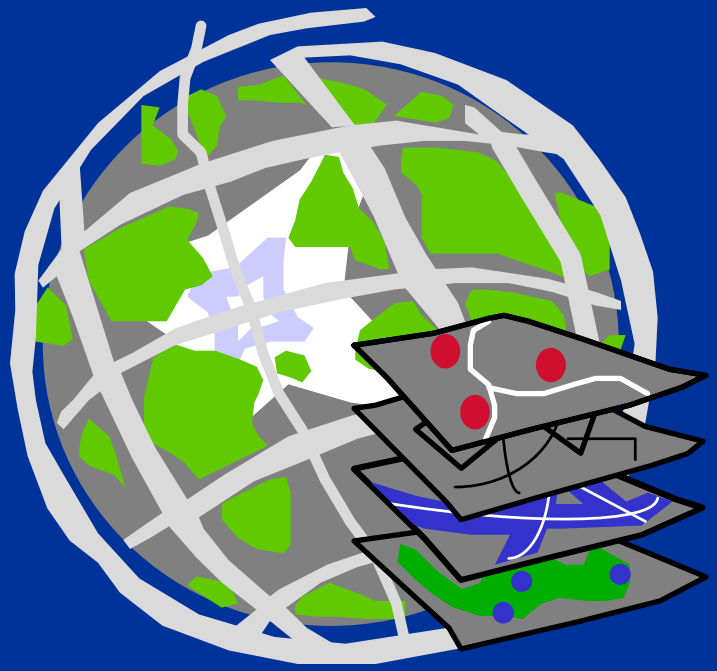
What is GIS?

Geographic

Information

System



What is GIS?

A **computer system** consisting of hardware and software that utilizes relational database technology and a topological data structure to allow the integration of raster and vector spatial data with tabular information for display, edit, query, analysis, combination, creation, maintenance, and management of **geographic data** sets in an environment that is customizable to meet the application needs of the users forming a powerful network of information that facilitates the sharing of data for **better decision-making**.

What is GIS?

A Method of **Organizing** Information

- **Geographic Data (Maps)**
- **Descriptive Data (Databases)**
- **Images (Photographs, Satellite Imagery)**

- A Method of **Analyzing** Data
- A Method of **Visualizing** Data
- A Method of **Distributing** Data

What is GIS?

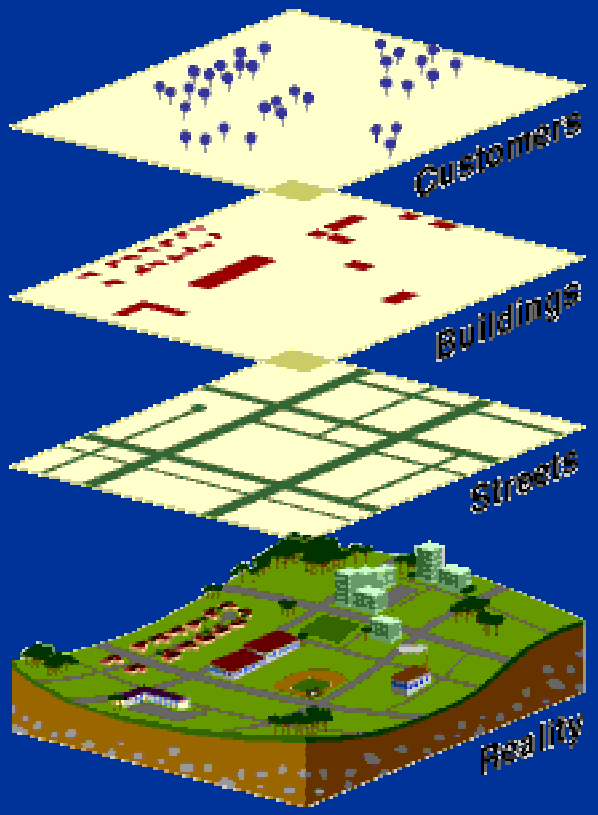
How GIS Works

- Information is stored as a collection of layers that can be linked together by a location on the earth.

What is GIS?

Why Use GIS?

- To explore **relationships** between **features** distributed over **space** looking for **patterns** that might not be obvious.



What is GIS?

- Cost Savings (Operational Efficiencies)
- Better Data Management
  (More Efficient Storage and Updating)
- Better Decisions
  (Faster Information Access)
- Enhanced Capability (New Applications)

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GRANIT

- Central data warehouse at Complex Systems Research Center, UNH, Durham
- Multiple data providers and data users
  - State government
  - Regional offices of federal agencies
  - Regional planning agencies
  - Municipalities
  - Non-profit organizations
  - Private sector
- Coordinating Committee – NH GIS Advisory Committee (est. 1987)
- FGDC/NSDI participant

GRANIT

- Mission

  To promote the efficient use of New Hampshire's diverse resources by utilizing spatial information in an effective way and by providing geographic information and related tools to citizens and organizations.

- How we strive to meet this mission:
  - Data development/archiving/distribution
  - Coordination/standards development
  - Applications/spatial analysis
  - Training and technical support

GRANIT

- Objectives
  - **Improve** state and local government **decision-making**
  - **Maximize limited financial resources** and avoid duplication in creating and updating elements in the statewide database through coordination of agency efforts
  - Encourage **multi-disciplinary** and **interagency** cooperation
  - Serve a centralized GIS database function, providing **access to and distribution of information** for the benefit of federal, state and local decision-makers and the public

GRANIT

- Resources

  Software: ArcGIS 9.1, ArcSDE 9.1, Leica Imagine 9.0, Trimble Pathfinder Office

  Hardware: Plotters, scanners, digitizing tablets, GPS units

  People: 6 full-time GRANIT staff, 5 part-time students, systems support staff

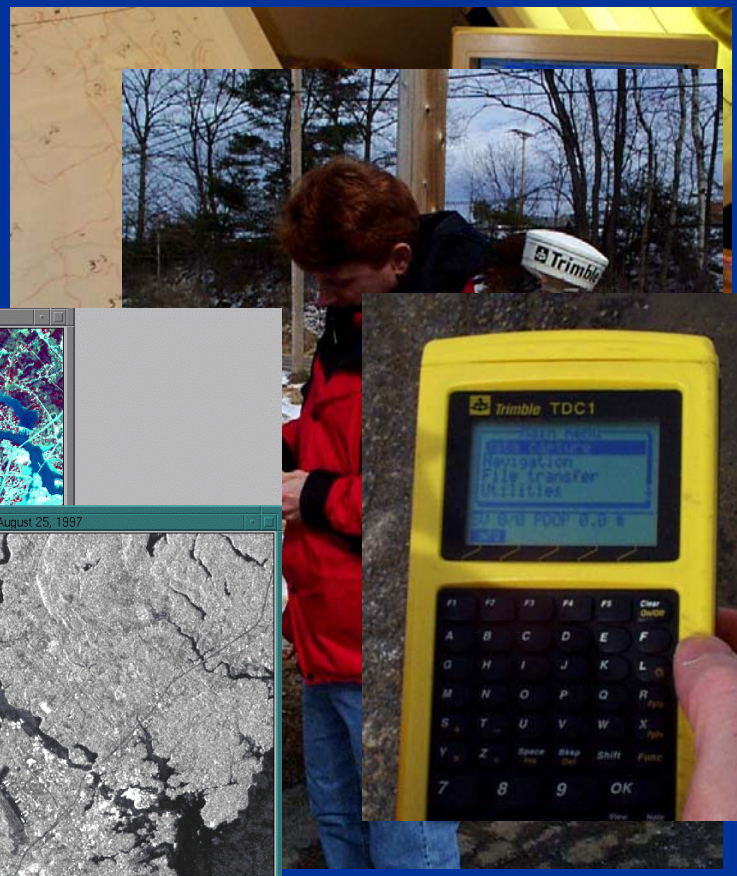
GRANIT

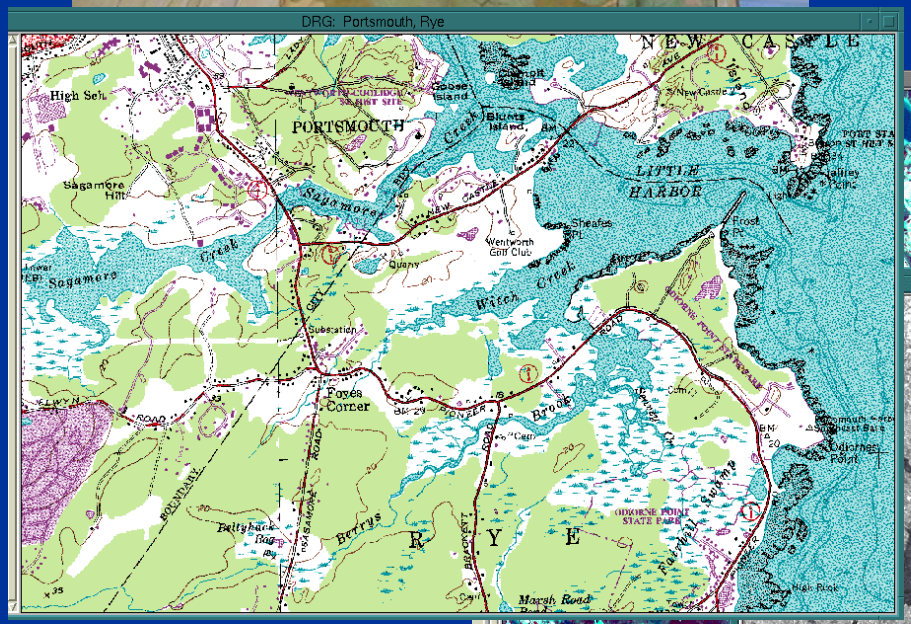
- Data Layers
  - Boundaries
  - Hydrography
  - Geodetic Control
  - Transportation
  - Terrain
  - Environmental Factors
  - Geology/Surficial Materials/Soils
  - Land Cover/Land Use
  - Photography/Imagery

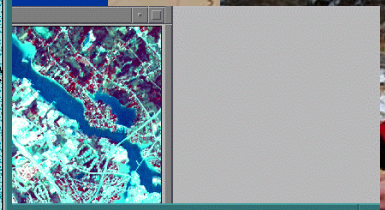
Data Layer:	Source:
Surface Waters	USGS/DES
Aquifers	USGS-Pembroke
Watersheds	DES
Wetlands-NWI	US F&WS
Well Inventory	DES
Floodplains	FEMA/CSRC

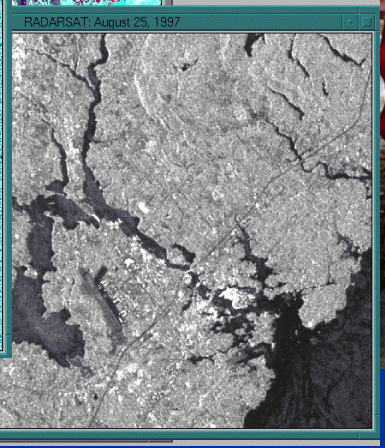
GRANIT

GIS – Integrating Technology









GRANIT

NH GRANIT Project Overview

Current Projects – March, 2006

PROJECT	SUPPORTED BY:	DESCRIPTION
Core Funding	NH Office of Energy and Planning NH Dept of Environmental Services NH Dept of Resources and Economic Development NH Dept of Transportation	Conduct basic GRANIT activities, including data maintenance, data distribution, web site maintenance, and provision of technical training and support.
GRANIT Web Site Enhancement	NH GIS Conservation Collaborative (NHGCC)	Develop online data mapping tools; enhance web site
NH GIS Strategic Plan – pending, in cooperation with OEP	USGS	Develop strategic and business plan for GIS in the State of New Hampshire
Map Modernization Management System	FEMA	Outreach and technical support to NFIP program in the state
Coos DFIRMs	FEMA – CTP	Develop preliminary DFIRM data
Merrimack DFIRMs	FEMA - CTP	Process preliminary data and generate preliminary DFIRM maps
Conservation Framework	NH Dept of Transportation	Develop conservation framework protocol within the I-93 corridor; initiate CommunityViz Resource Center
Historic Quads	UNH Office of the Vice President for Research and Public Service	Scan and georeference historic USGS topographic maps
Forest Stands Mapping	NH Dept of Resources and Economic Development	Develop data sets for state forests
Conservation Lands Update	NH Estuaries Project	Update conservation lands data layer
Impervious Surface Mapping	NH Estuaries Project	Develop time series of impervious surface coverage
Coastal Buffer Analysis	NH Estuaries Project	Characterize buffers within coastal watersheds
Parcel Pilot - pending	NH Dept of Transportation	Refine town boundaries and produce parcel mosaic for 3-town pilot area

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Map Mod in New Hampshire

- FFY 2003 FEMA initiated a Flood Map Modernization Program (FMMP)
- Goal – upgrade flood hazard data to create a more accurate digital product that will improve floodplain management across the country
- Five year program
- Priority given to areas with greater population, need, and ability to leverage resources

Map Mod in New Hampshire

- Collaborators
  - GRANIT at Complex Systems Research Center
  - NH Office of Energy and Planning
  - FEMA

Map Mod in New Hampshire

- Why
  - New/standard technology
  - Seamless coverage
  - Spatial analysis
  - Data currency/management
  - Multiple distribution options
  - Facilitates future updates

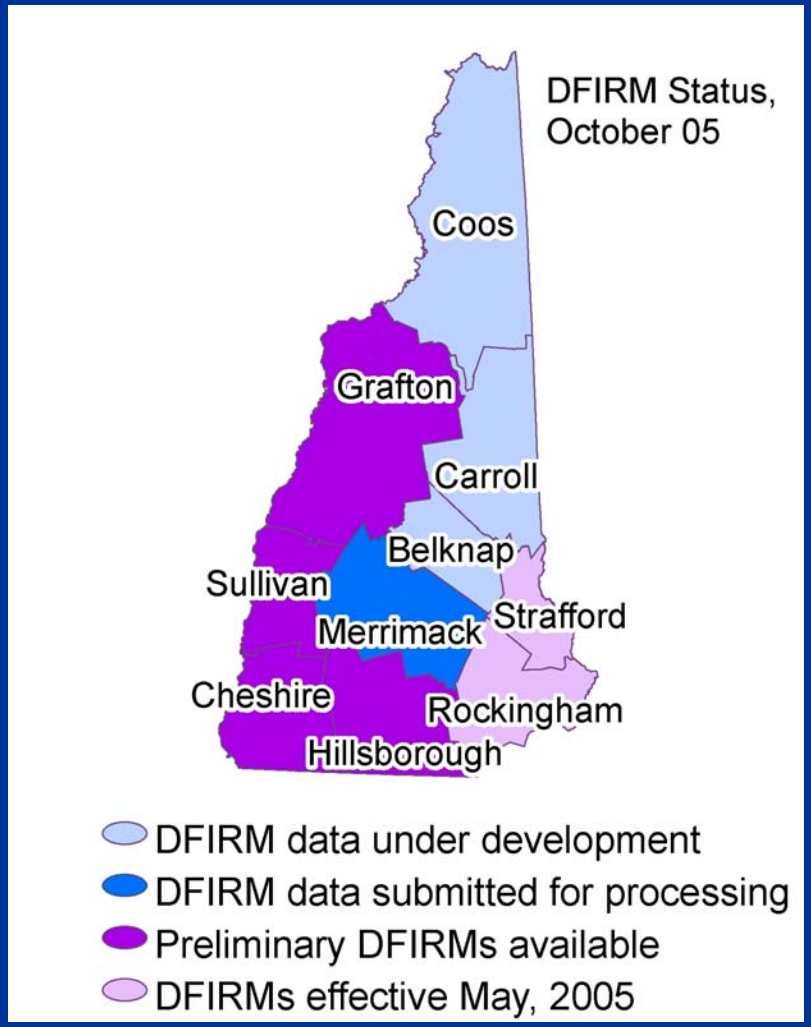
Map Mod in New Hampshire

- Outcomes
  - Digital data
  - Web-based
  - Transfer knowledge from feds to local gov’t
  - Local ownership of the data

Map Mod in New Hampshire

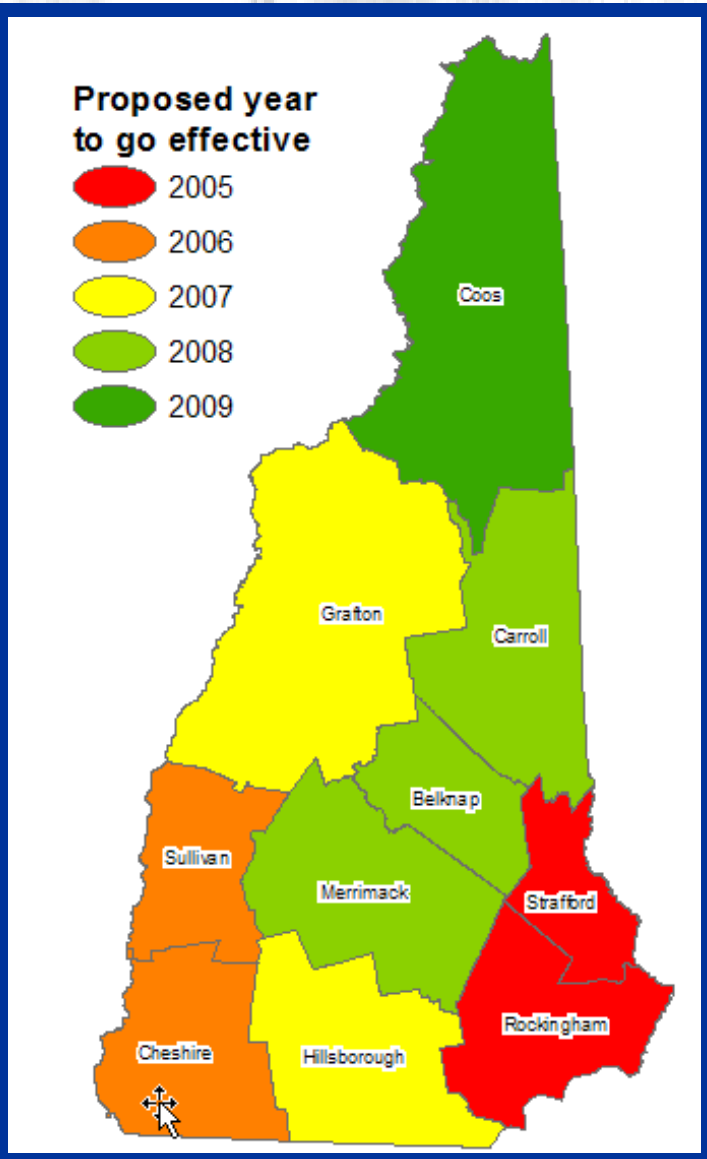
- Benefits
  - Help to prevent and reduce losses
  - Pooling resources
  - Involving all stakeholders in the process
  - Eventually, local stakeholders will be able to add their own data to the DFIRMs

Map Mod in New Hampshire



Source: http://granit.sr.unh.edu/dfirms

Map Mod in New Hampshire



- ***Effective*** DFIRMs and FIS
  - Rockingham 5/2005
  - Strafford 5/2005
- ***Preliminary*** DFIRMs and FIS
  - Cheshire 5/2006
  - Sullivan 5/2006
  - Grafton spring 2007
  - Hillsborough spring 2007
- ***Proposed*** DFIRMs and FIS
  - Belknap spring 2008
  - Carroll spring 2008
  - Merrimack spring 2008
  - Coos spring 2009

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Differences between FIRM and DFIRM

- FIRMs v DFIRMs
  - Paper v digital products
  - Seamless coverage
  - Spatial analysis
  - Facilitates future updates

DFIRM Methodology

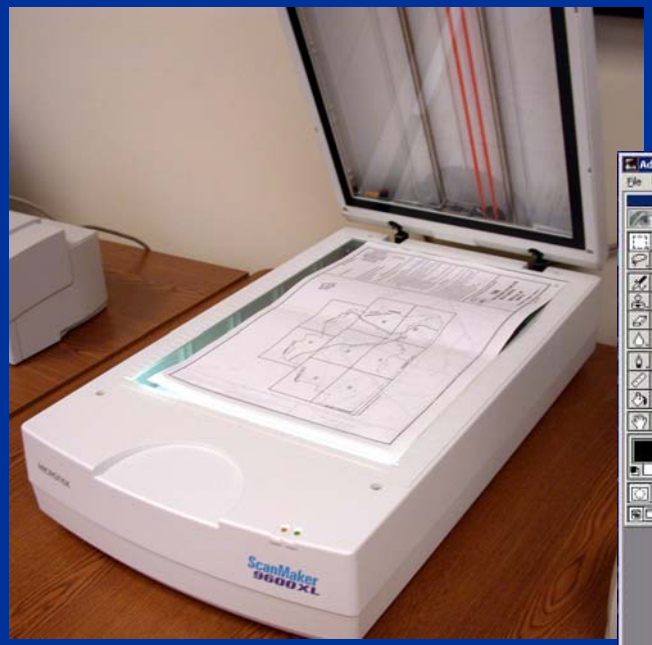
Assemble primary data sources

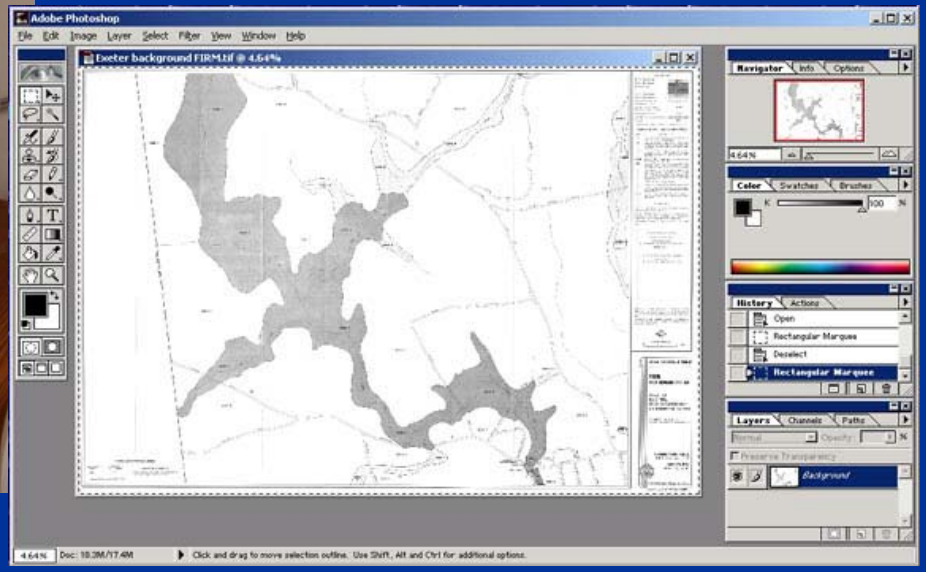
- Published FIRMs
- LOMRs
- DOQs
- Other GRANIT data (town bounds)
- Locally available data (e.g. Salem road data)
- DOT road names

DFIRM Methodology

Scan source maps

- Acquire images (in-house or contract scanning or FEMA Map Store)
- Process images with Photoshop

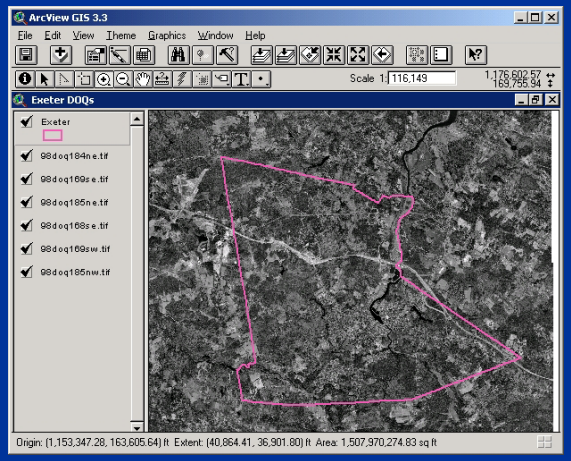




DFIRM Methodology

Create updated base map

- Mosaic DOQ tiles for a town
- Screen-digitize streams/water bodies
- Print base map on stable media - DOQs with newly compiled streams and town boundaries

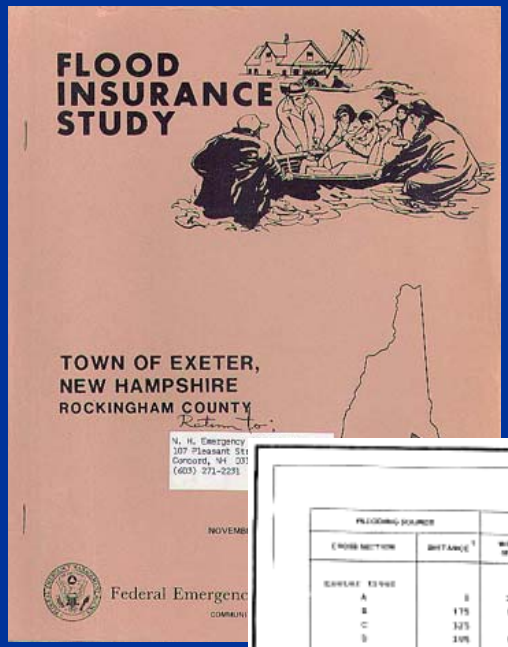


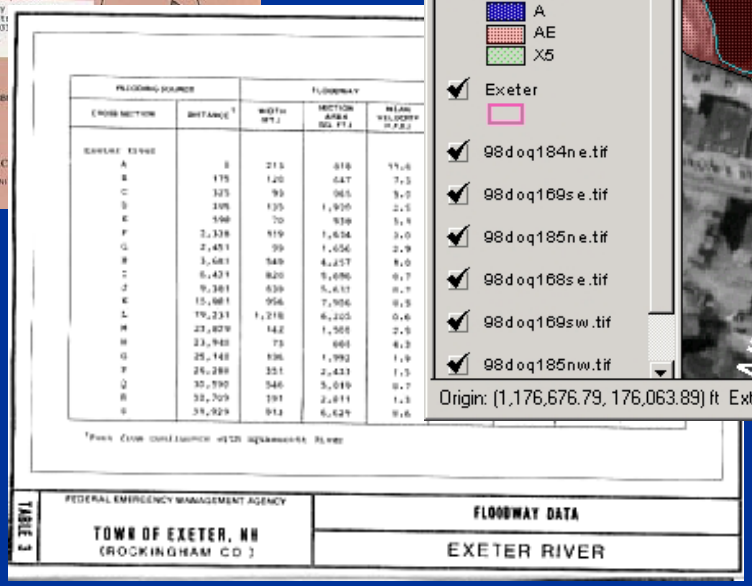
DFIRM Methodology

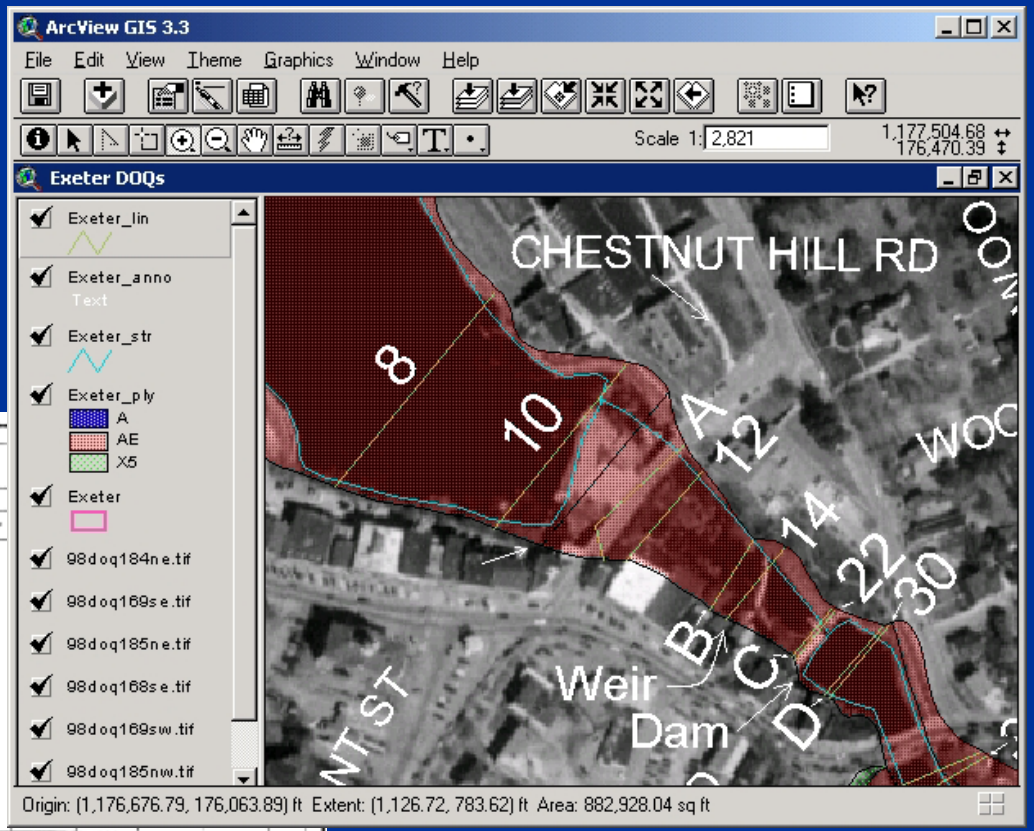
Automate floodplain features

DFIRM Methodology

Develop cross section data

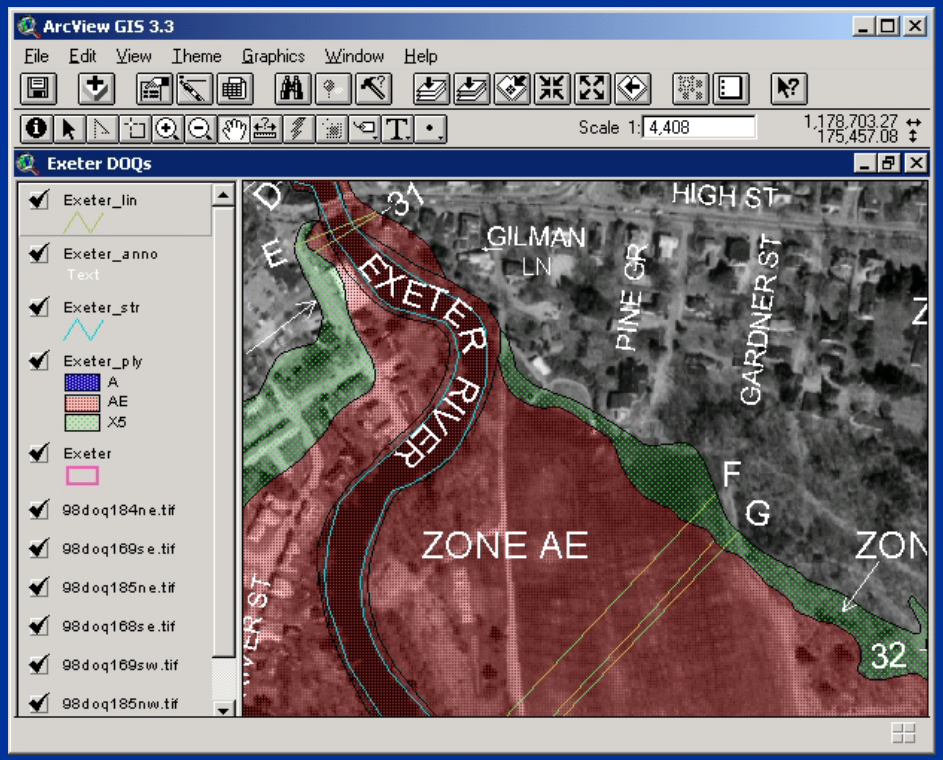






DFIRM Methodology

Add annotation



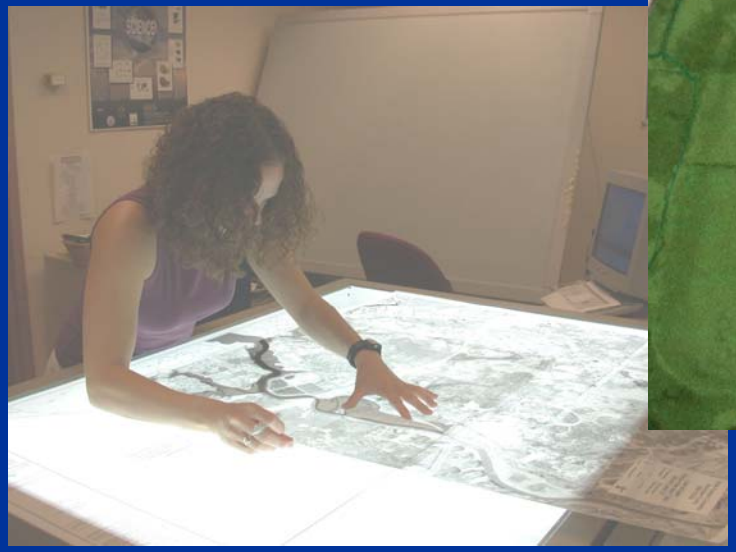
Floodplain zones
Road names
Surface water body names

DFIRM Methodology

Generate checkplot

DFIRM Methodology

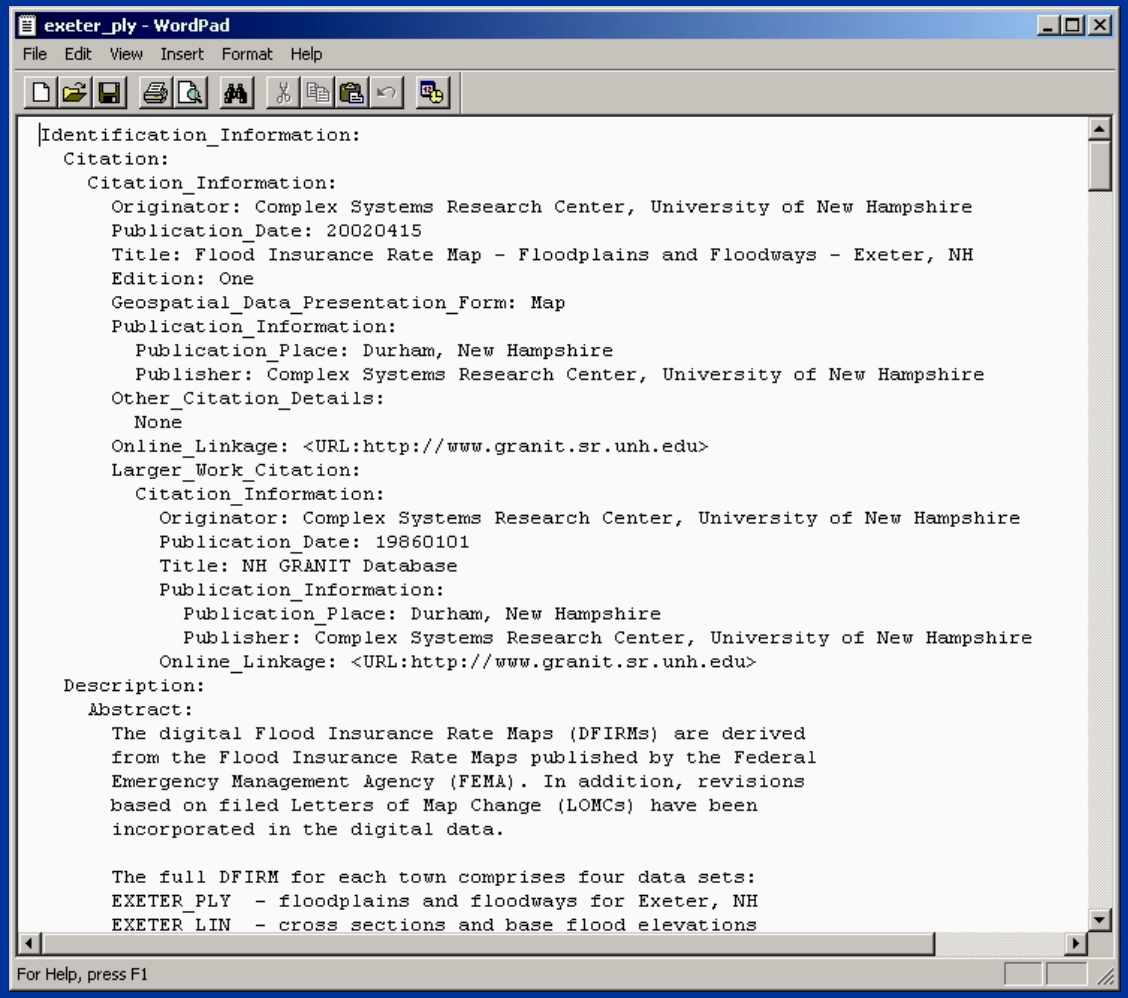
Conduct QC



Verify digitizing accuracy, check codes and annotation

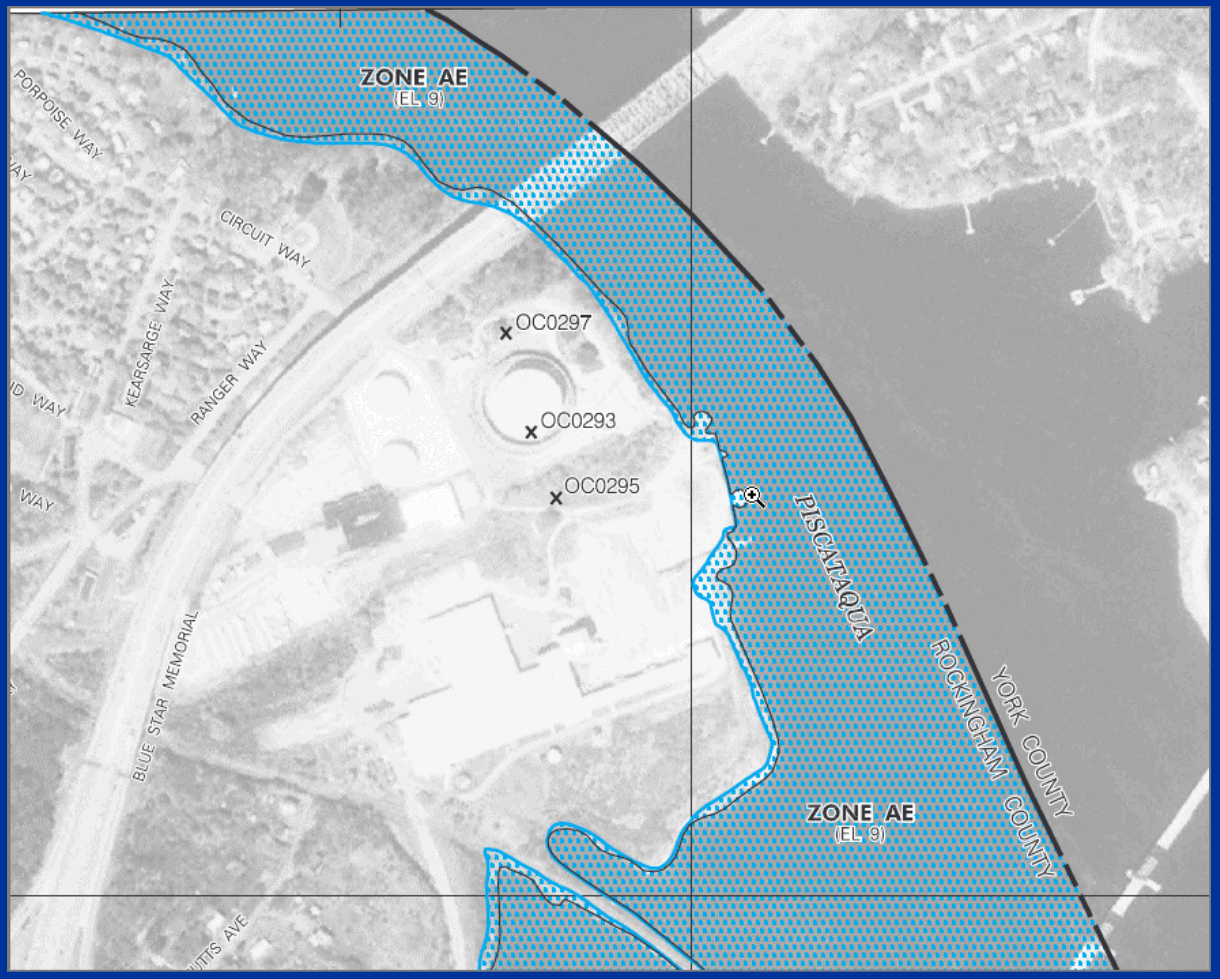
DFIRM Methodology

Create metadata



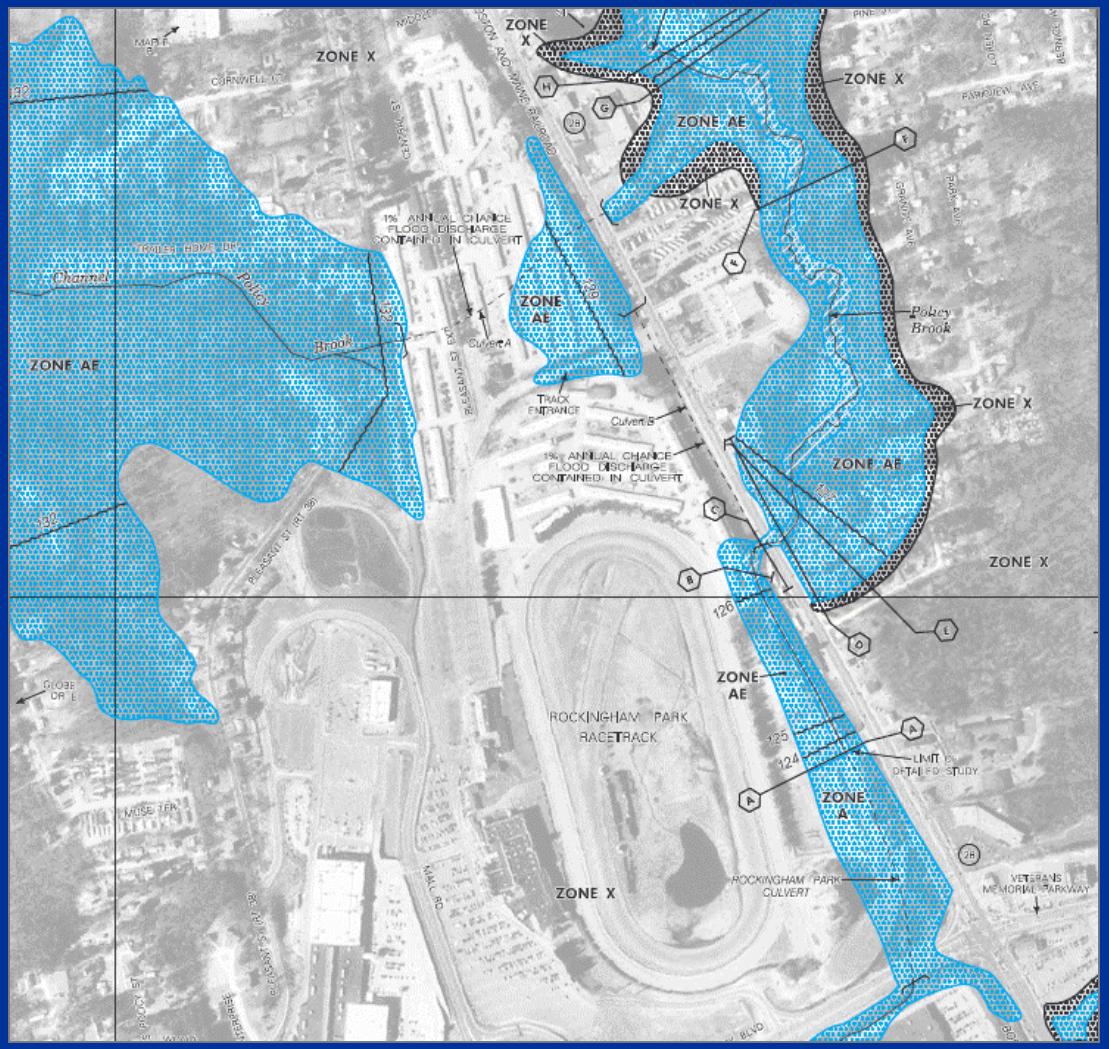
Differences between FIRM and DFIRM

Portsmouth



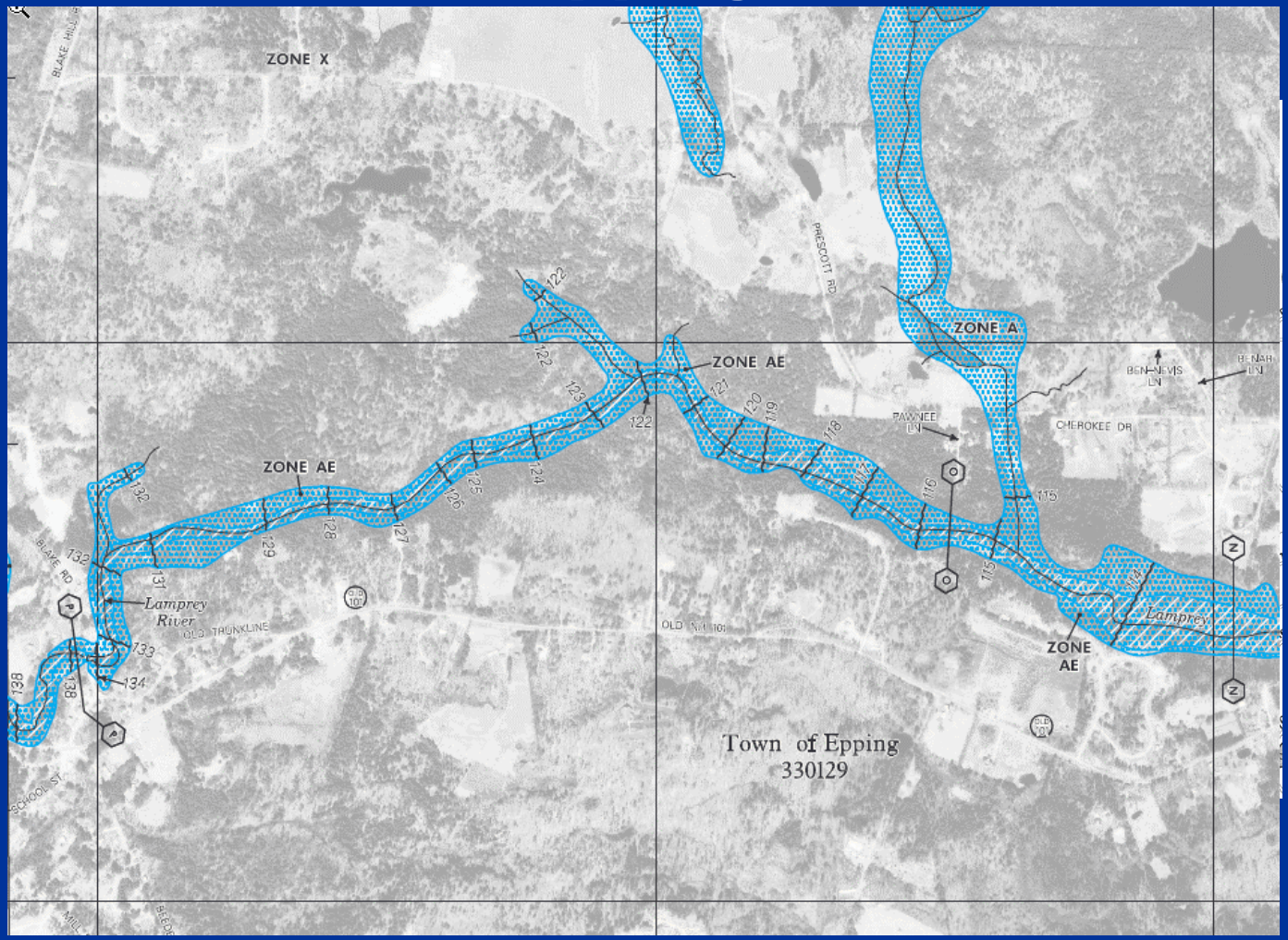
Differences between FIRM and DFIRM

Salem



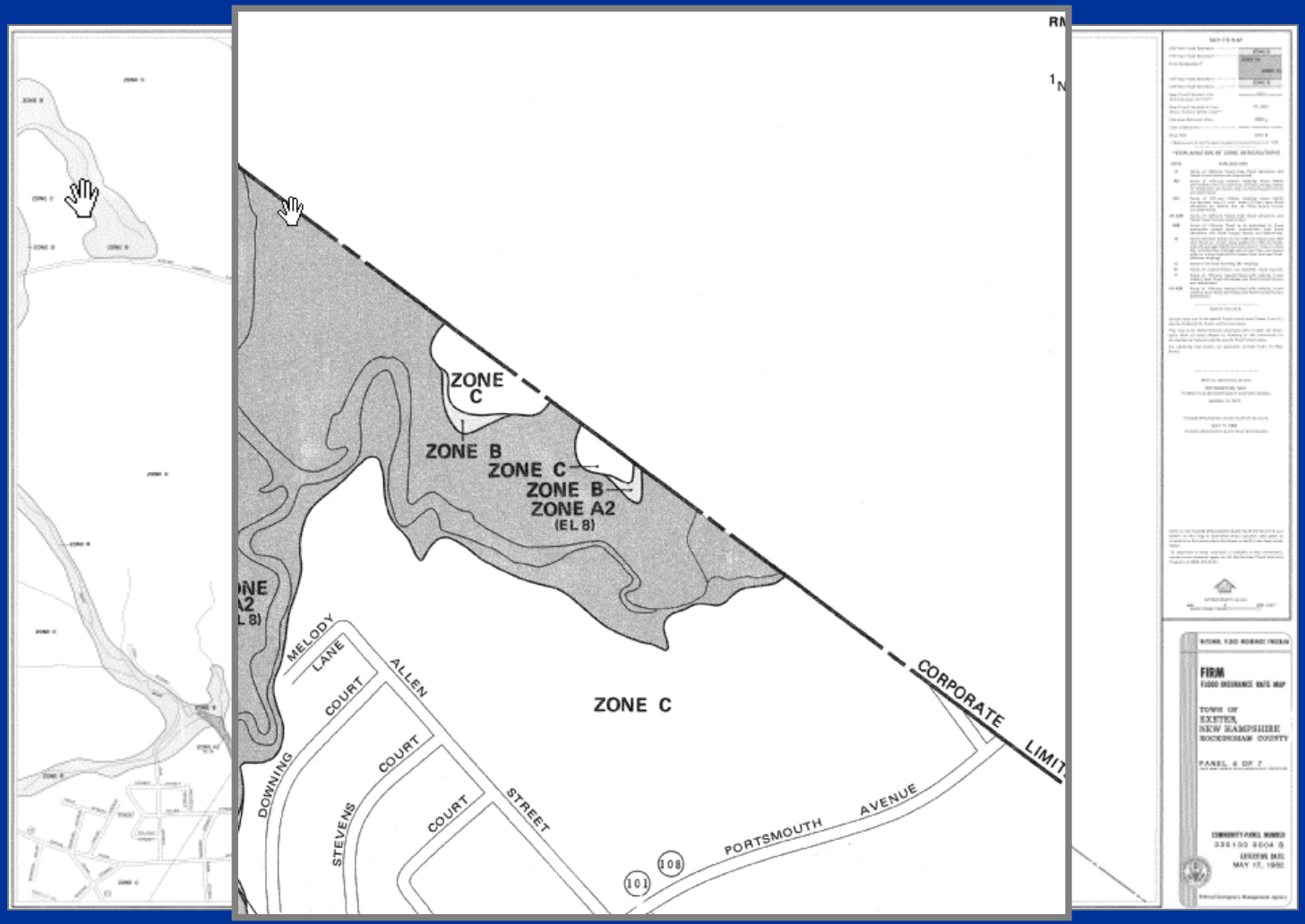
Differences between FIRM and DFIRM

Epping



Differences between FIRM and DFIRM

Exeter/Stratham



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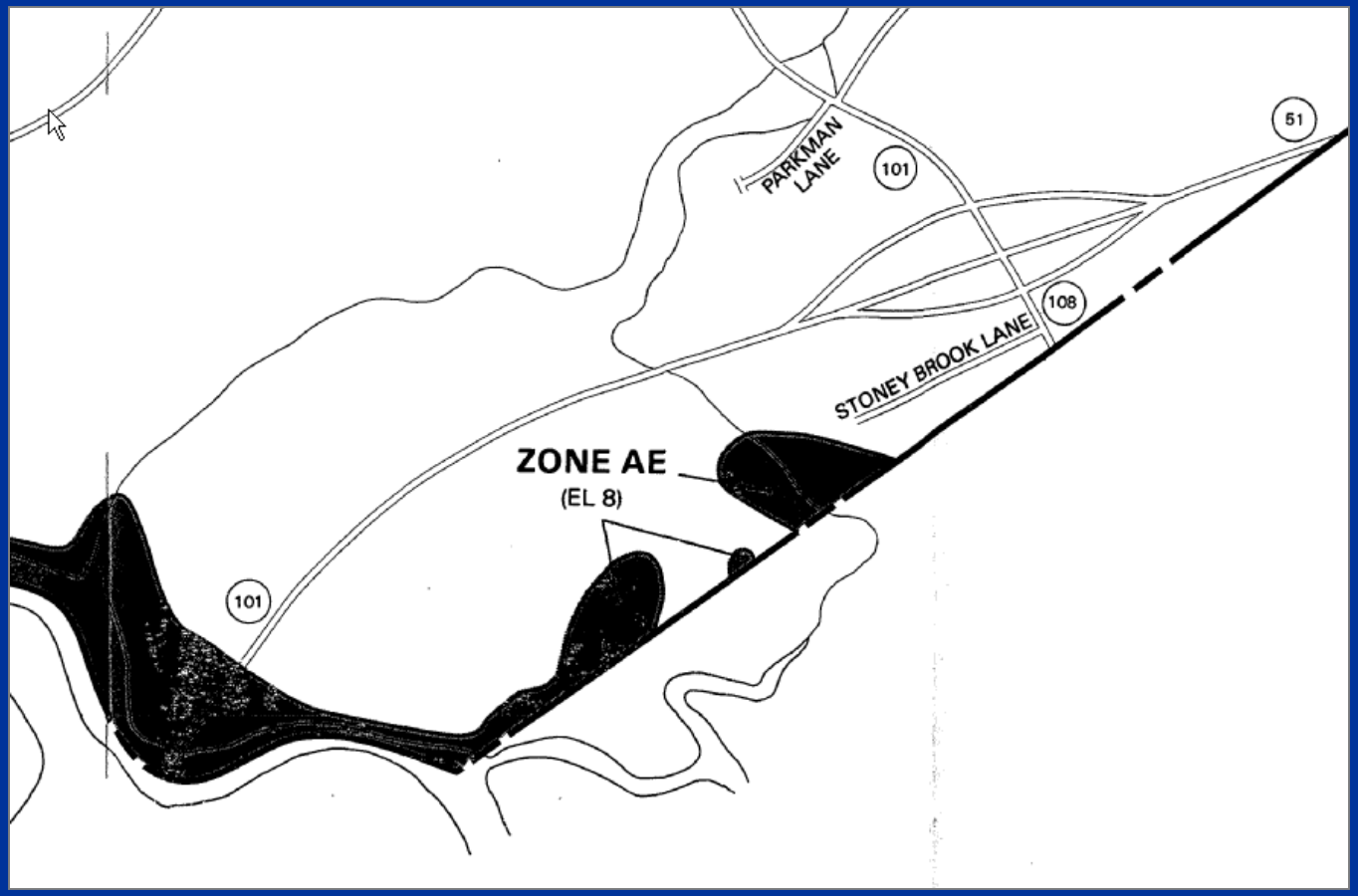

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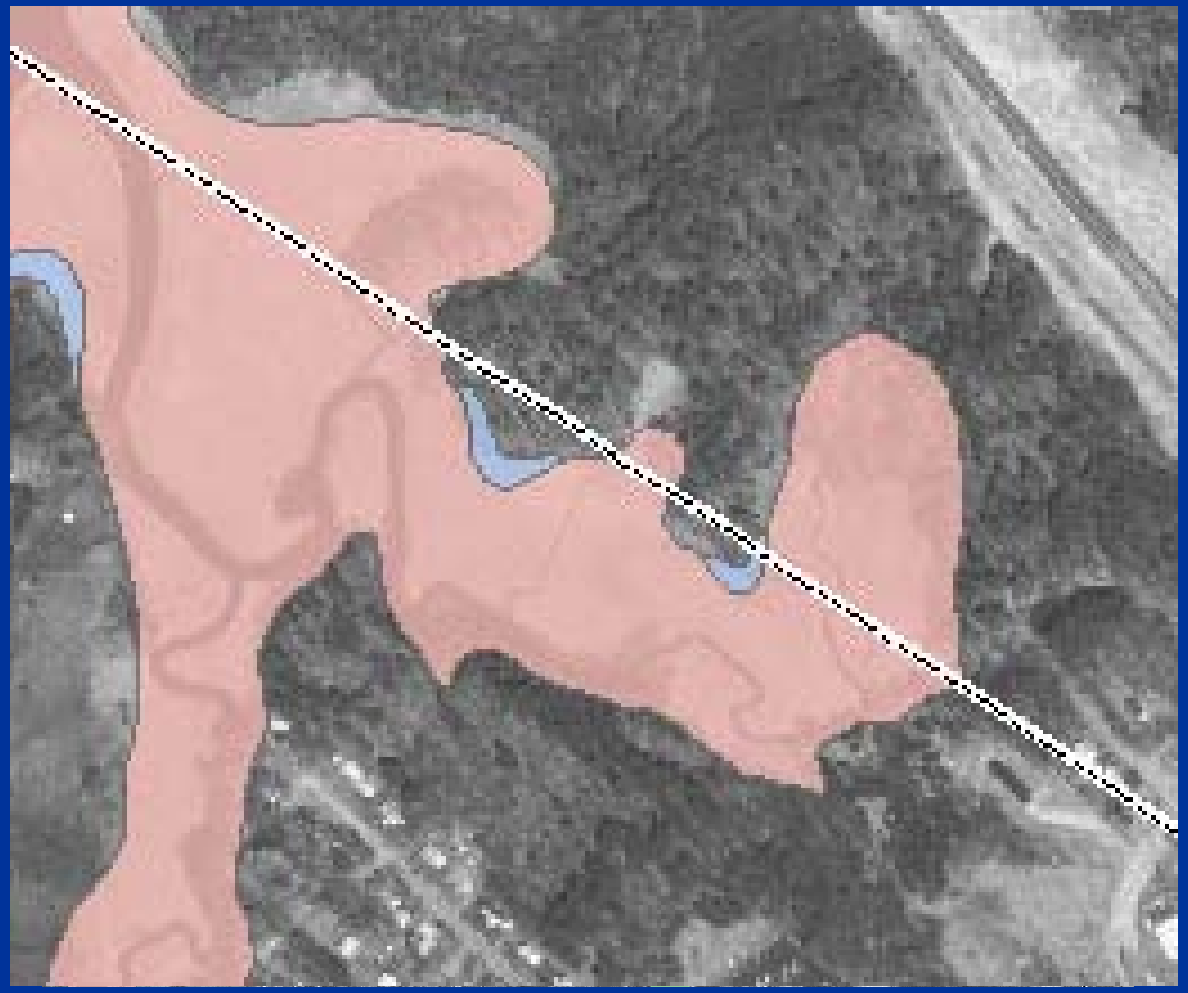
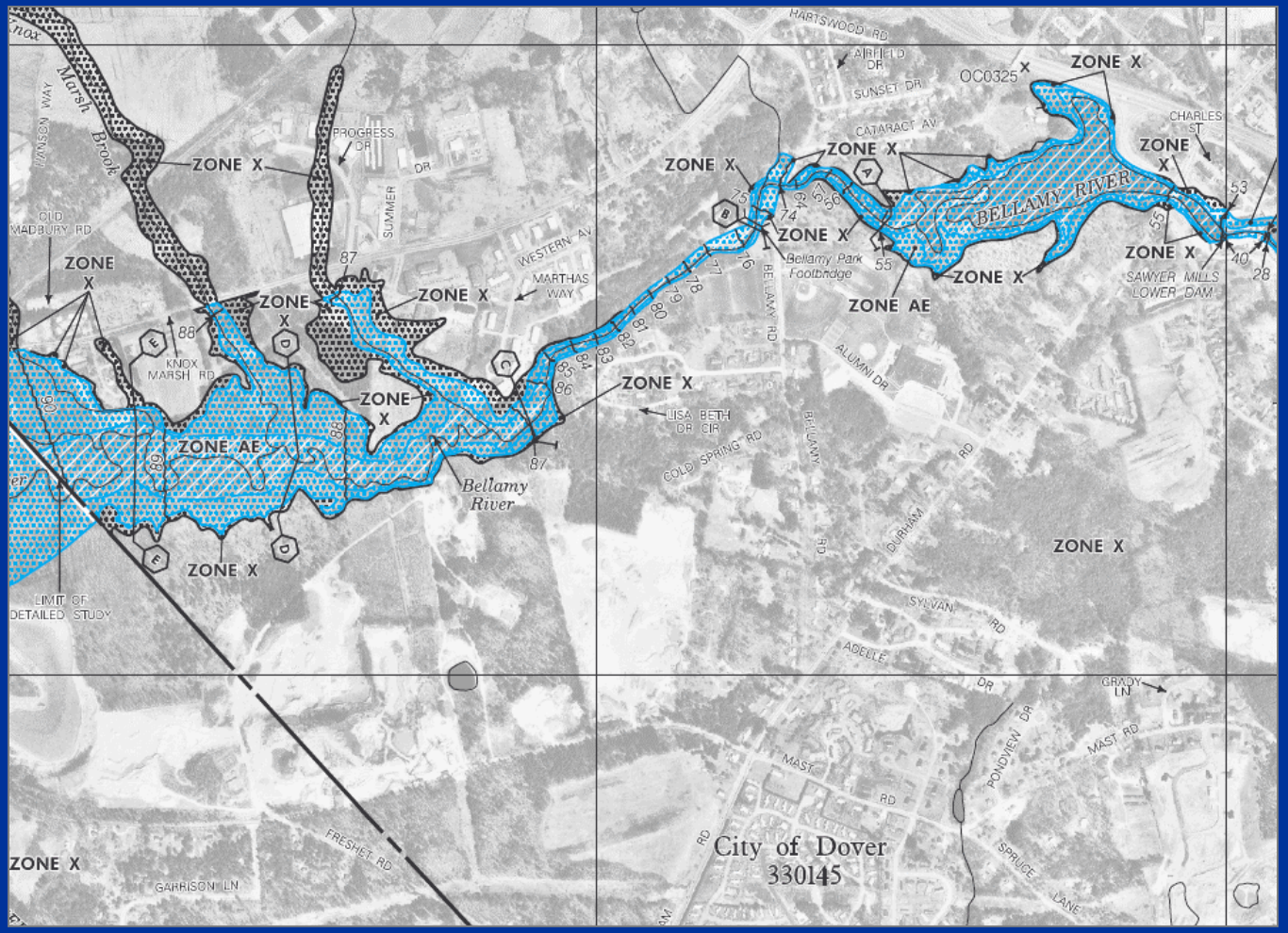


Differences between FIRM and DFIRM

Dover

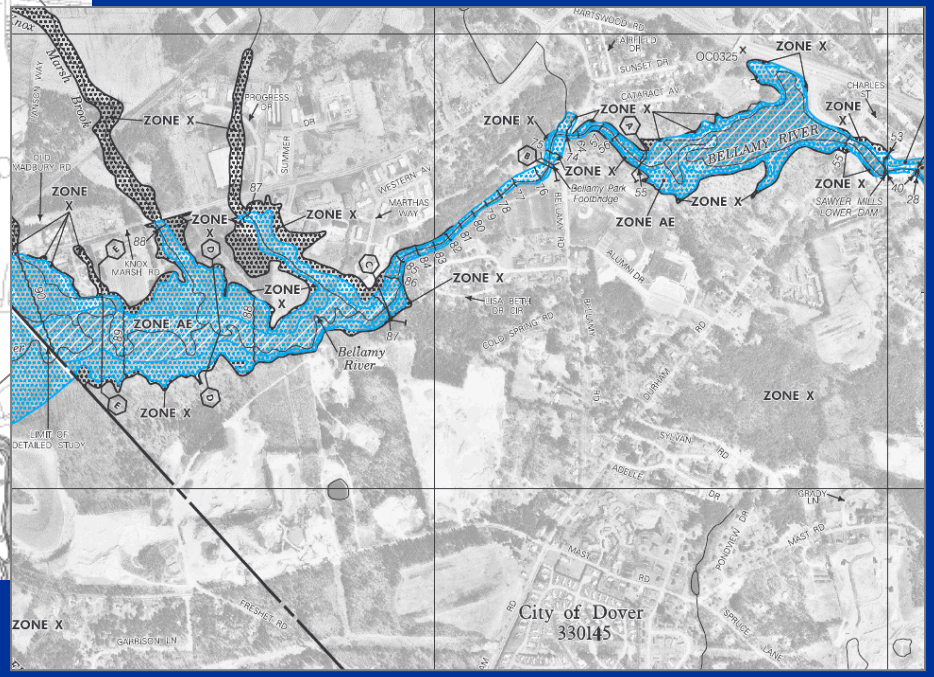
Differences between FIRM and DFIRM

Dover



Differences between FIRM and DFIRM

Dover



Overview of Presentation

- Floodplain 101
- NFIP Background
- NFIP Overview
- What is GIS?
- GRANIT
- Map Mod in NH
- Differences between FIRM and DFIRM
- Demos DFIRMs and IMS
- You make DFIRMs better
- Questions

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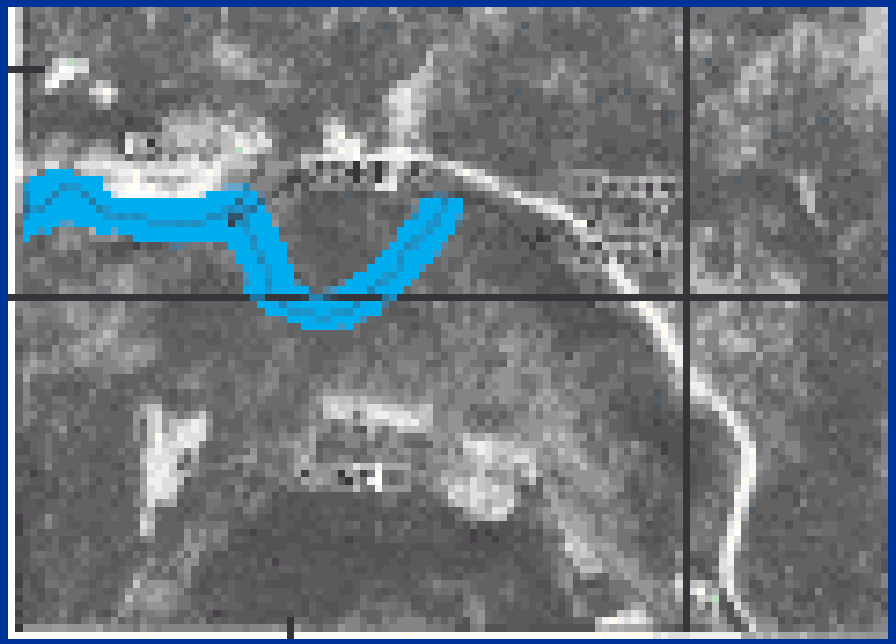
- Questions

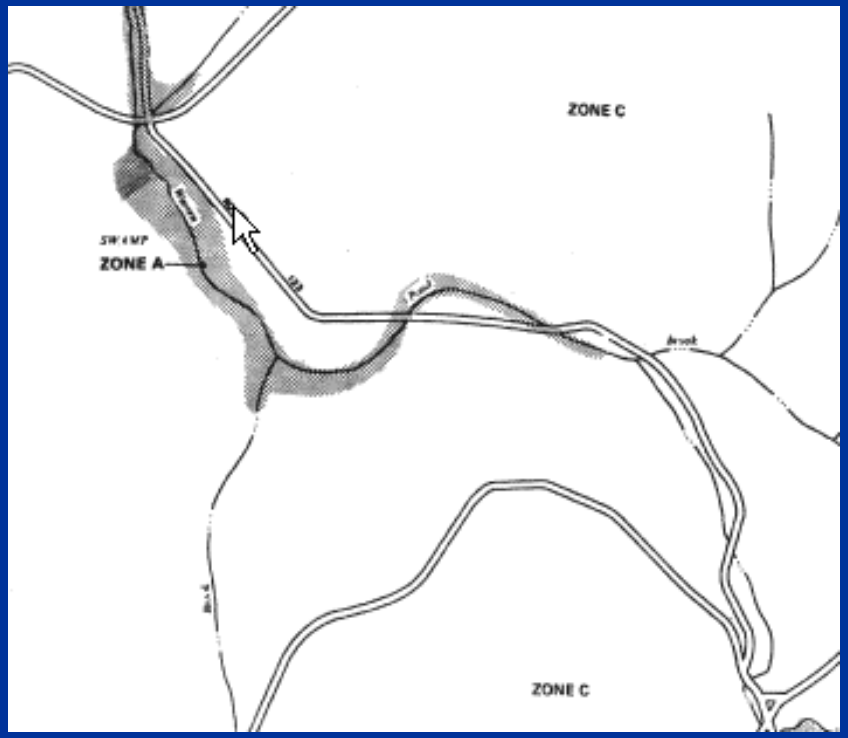
You make DFIRMs better

- Not ‘garbage in/garbage out’
- Best available data that can be made better with local knowledge
- This is just the beginning

You make DFIRMs better

You make DFIRMs better





You make DFIRMs better

- Current contacts for getting changes added
  - Jennifer DeLong, NH OEP
    Jennifer.DeLong@nh.gov
  - Brent McCarthy, FEMA I, RMC
    bmccarthy@watershedconcepts.com

You make DFIRMs better

- Future methods for making changes
  - Website to collect the errors
  - Redlining
  - Automatic updates for some data layers

Questions?

Jennifer.DeLong@nh.gov
Jennifer.Merriam@unh.edu

For further info:

http://www.nh.gov/oep/programs/floodplainmanagement
http://www.granit.sr.unh.edu/dfirms

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BE FLOOD ALERT
NATIONAL FLOOD INSURANCE PROGRAM

THANKS and enjoy the rest of the conference!

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